# Western RADIO Amateur

February 28 1959

25c

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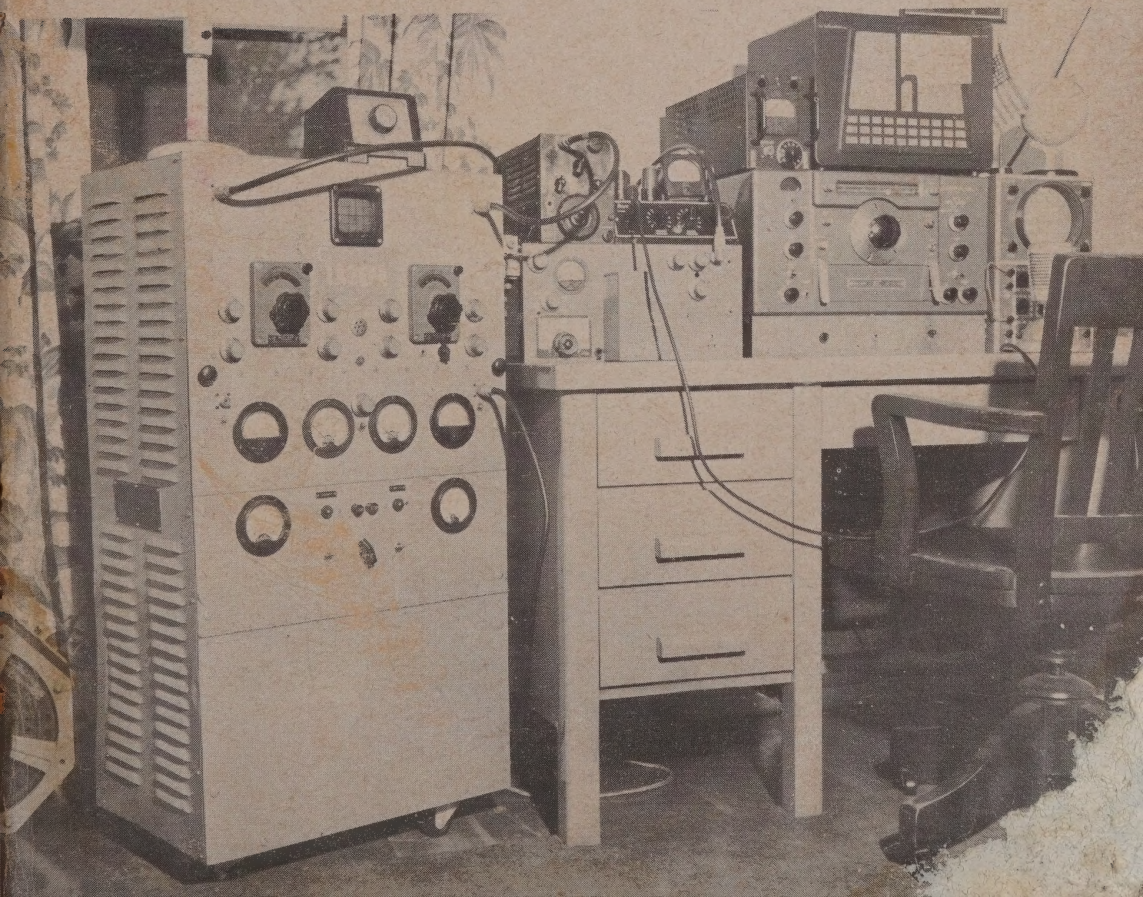

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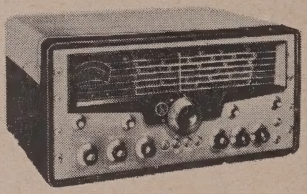

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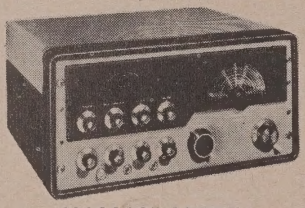

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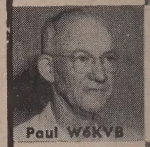

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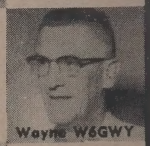

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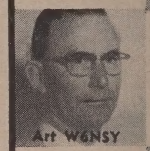

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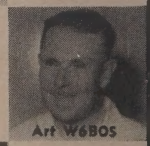

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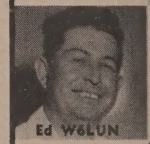

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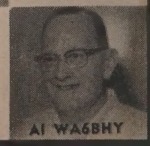

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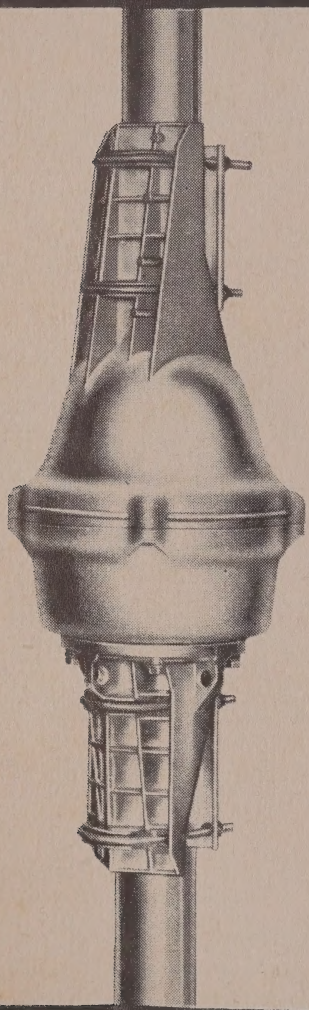

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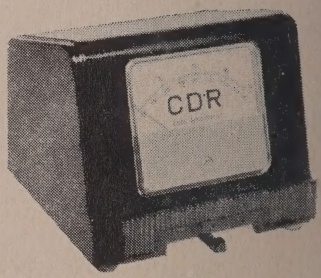


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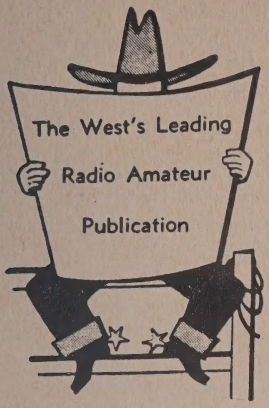



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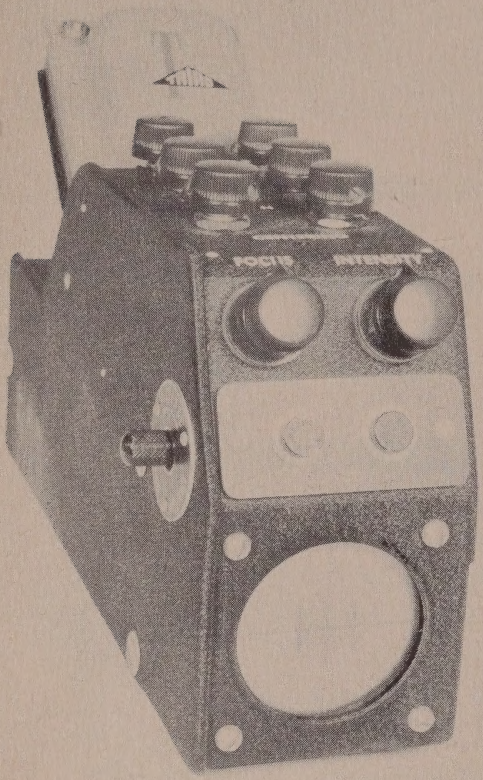
# THE "MICRO-SCOPE"



**Charles Caringella W6NJV**
**P. O. Box 1025**
**Ontarion, California**

The Micro-Scope is a complete oscilloscope which practically fits in the palm of your hand! The scope measures approximately 2½ inches wide, 4½ inches high and 9 inches long. It is capable of performing as well as a scope 20 times its size. (This figure is not a guess but was actually computed.)

The Micro-Scope is a conversion of the surplus APG-15 indicator, which was part of the APG-15 airborne fire control radar system. (This unit is available from C & H Sales Company in Pasadena, California). The original indicator unit contains a 2AP1 cathode-ray tube, focus and intensity controls, two instrument lamps for edge lighting of the plastic face, and miscellaneous parts. The indicator conveniently dis-assembles into two sections, exposing the top section so the amplifiers and the power supply may be wired easily.

SPECIFICATIONS

Vertical Channel
- Sensitivity (full gain) 1 volt/inch
- Frequency Response Flat from 10 cycles to 20 KC. Useable to .5 MC.
- Input Voltage (max.) 400 volts

Horizontal Channel
- Sensitivity, Same as Vert.
- Frequency Response, Same as Vert.
- Input Voltage (max.) 400 volts

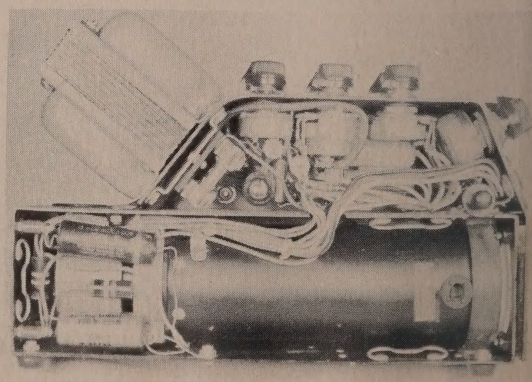
Time-Base Generator
- Frequency Range, 30-1000 cycles, variable, in two ranges.

Tube Complement
- Vertical Amplifier, ½12AX7
- Horizontal Amplifier, ½12AX7
- Time-Base Generator, NE48 Neon Bulb
- High Voltage Rectifier, Four 1N1448, Silicon Diodes

Controls
- Intensity, Focus, Vertical Position, Horizontal Position, Vertical Gain, Horizontal Gain, Sweep Range Switch, Sweep Vernier Control, Horizontal Sweep/Horizontal Direct Switch.

DESCRIPTION

The schematic of the completed scope is shown in Figure 1. The transformer used in the power supply is the Triad R-3A, with no connection to the high voltage windiing center tap. Thus, the entire secondary voltage appears across the rectifier and filter. Four 1N1448 silicon diodes are used in series as a half-wave rectifier. The 1N1448's have peak inverse voltage rating of 300



volts. Three 1N1559's which have a peak inverse rating of 400 volts, may be used in place of the others. Since the entire scope draws little current, the filter input capacitor charges to nearly 600 volts D.C. This voltage is applied to the cathode-ray tube and produces a trace bright enough to be seen in daylight. The cathode-ray tube

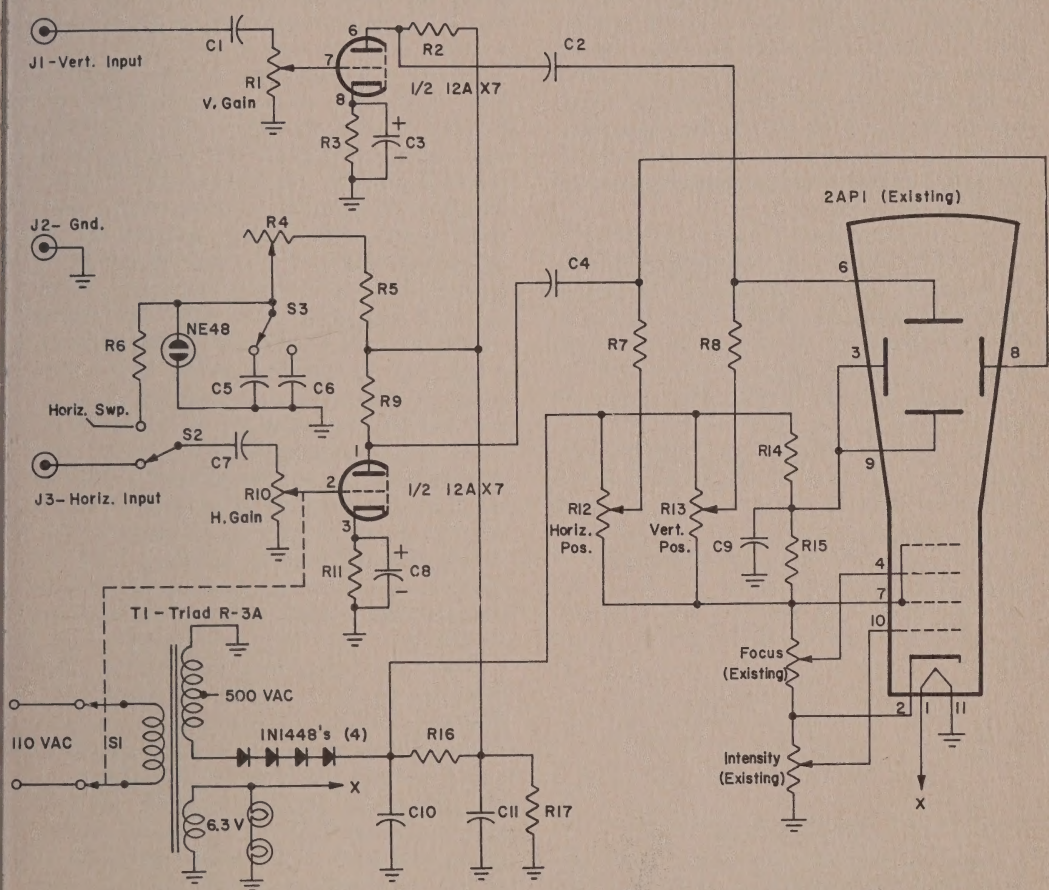



FIG. 1- Circuit Diagram of the "MICRO-SCOPE".

## PARTS LIST

C1, C7- .05mfd., 400 V., midget tubular
C2, C4- .02 mfd., 600 V.
C3, C8- 50 mfd., 15 V., miniature electrolytic
C5- .01 mfd., 400 V.
C6- .002 mfd., 400 V.
C9- .1 fd., 600 V.
C10- .5 mfd., 600 V
C11- 4 mfd., 450 V., electrolytic
R1, R10, R12, R13- 1 Meg, Linear, Centralab B-69
R2, R9- 100K, 1/2 watt
R3, R11- 2.7K, 1/2 watt
R4- 10 Meg, Linear, Centralab B-98
R5- 4.4 Meg, 1/2 watt
R6, R7, R8, R14, R15- 1 Meg, 1/2 watt
R16, R17- 100K, 2 watt
J1, J2, J3- Pin jacks
S1- D.P.S.T. switch, Centralab KR-2
S2- S.P.D.T. slide switch
S3, S.P.D.T. miniature rotary switch, Grayhill series 5000.
T1- Power Transformer, Triad R-3A
Misc.- Four 1N1448's, Arrow Sales Catalog No. 30A1, Silicon diodes.
12AX7, vacuum tube and socket
NE-48, neon lamp

will operate on as low as 300 volts with a large loss in trace brightness. The 100K divider networt supplies 300 volts to the amplifiers.

A high-mu twin triode, the 12AX7 serves as the vertical and horizontal amplifiers. The two sections operate as Class A amplifiers with an approximate gain of 70 for each stage. The time-base or sweep generator is a neon relaxation oscillator whose output waveform is a sawtooth. The input jacks, J1, J2, J3 and the horizontal input switch, S2, cannot be seen in the phographs. These are located on the right-hand side of the scope. The exact location is given in the drawing in Figure 2.

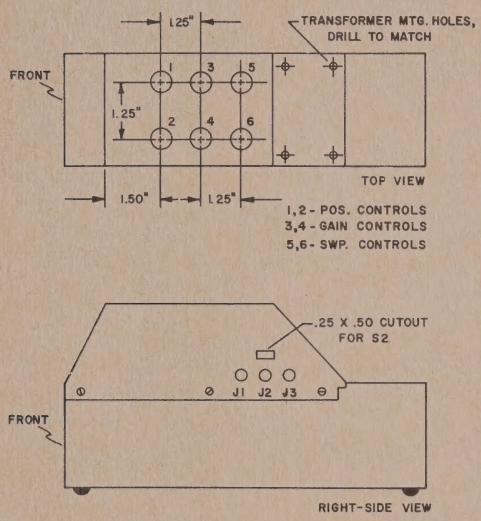



FIG. 2 – Hole Layout

## CONVERSION

Remove the left side-panel and the screws along the right side, the front, and the back. The unit will now come apart in two sections to facilitate removal of unnecessary parts, and later, wiring the circuit. Next, remove the interconnect cable, the transformer, the 6AL5, and the miscellaneous resistors and capacitors. These may be "filed" in the junk box. Leave the intensity and focus controls in place. The cable leading to the cathode-ray tube should be left as long as possible. These leads will be connected to the circuit in the upper compartment prior to final assembly of the scope.

Rubber feet may be installed on the bottom of the scope if desired by removing the cathode-ray tube and its shield. Remove the bracket assembly on the outer right-hand side by drilling out the rivets. This bracket was originally used to hold the indicator in place on board the aircraft.

Drill all the holes and make the cutout as shown in Figure 2. Install the power transformer and use one of the transformer mounting screws to hold a solder lug. Use this lug to ground one side of the filament winding and one side of the high voltage winding. Cut the high voltage center-tap lead short, and wrap it in electrical tape to keep it from shorting to anything. Install the input jacks and the slide switch on the side and the six controls on the top. The power switch, S1, is part of the horizontal gain control. The 12AX7 is mounted horizontally with the tube socket being supported by an "L" bracket. The bracket is 1¼ x 1¼ inches on a leg. The silicon diodes are held in place with fuse clips on a piece of bakelite or plastic 1¼ x 1½ inches. These are mounted as close as possible without touching. The two capacitors and two resistors of the power supply filter are located in the lower compartment as shown in the photograph. Use a couple of small standoff insulators here. A five lug terminal strip accomodates the connections not made directly to a solder terminal on a potentiometer, or the tube socket, etc.

Wire the scope according to the schematic in Figure 1. Keep all leads short. The neon bulb is soldered directly into the circuit. The cable from the cathode-ray tube is routed along the side as shown in the photograph and the leads are soldered into the circuit. Cut a notch, ½ inch radius, in the top part of the lower compartment so the cable will clear with the side cover on. The scope is now ready to be assembled.

## OPERATION

Re-check all wiring before applying power to the scope. Apply power, check the filaments and the power supply voltages. If an audio oscillator is available, it would be advisable to check out the vertical and horizontal amplifiers. Briefly, the scope can be used to check out audio amplifiers, modulators, waveform investigation, etc. Additional information may be obtained from textbooks, handbooks, and magazine articles dealing with the operation and application of oscilloscopes and available at most libraries.

---

# A 3 Tube Transmitter for 75 and Two meters

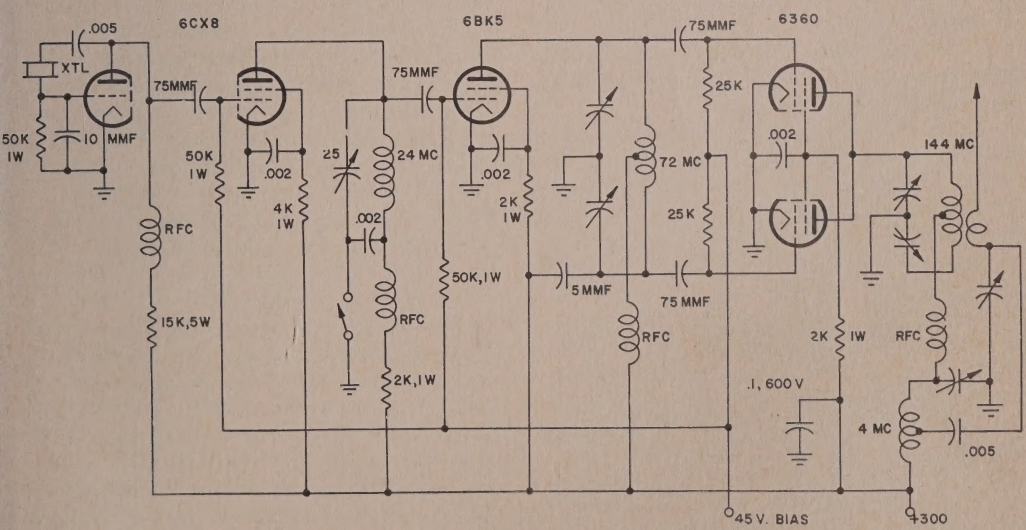
**RAY FULTON, K6BP,**
**% Fulton's Radio Service,**
**Highway 120, Manteca, Calif.**

And hello to you too! Many of you I know, some I do not. Perhaps this is good, or bad, depending on which side of the fence you stand on. Anyhow, by way of introducing myself, will simply say that I have had a ticket some 44 years, am old enough to know better but will never learn, because I still like to build my own gear!

From time to time, editor permitting, I shall burst forth in print with ideas that have proven better than the average, and *work*. At the present time I (we is just as correct because there are two of us here) have constructed quite a few transmitters, amplifiers, antennas, etc., that merit above average. Not all . . . but some. I believe that a description of the better ones will be of general interest to most of you, as they are not the usual run of the mill gear, but special

At the present time we have just completed a transmitter which works equally well on two meters and 75 meters. It is not a mess, but a well designed circuit that has proven to be satisfactory in actual use. It delivers over 10 watts on 144 megs and over 15 watts on 75 meters. If more is desired, a higher power tube can be used in the final, such as an Amperex 6907 or RCA 6524 (a bit like the 829B). This will more than double the output over the Amperex 6360 used in the design to be described.

As a modulator, we use a single 6V6. By itself, this tube would only put out approximately 6 watts of audio. However, by throwing part of this audio back into the




One of the most useful gadgets in building a rig such as this is a grid dipper. As most of you will use what variables you have around the shack, choice of variables and coil lengths, diameters, etc is left up to you and your grid dipper. If you get stuck, drop me a line, or drop by in person.

Note: Only one crystal has been shown to clarify circuitry. Simply use a two deck isolantite two position switch. One deck changes crystals, the other opens the by-pass condenser in the first tripler. You can use 3 decks if desired, to change over to a separate antenna.

screen grid circuit of the final, we get the desired amount of modulation on the carrier. It makes for better end results this way anyhow. I hope that you are interested by now, so here is the dope as outlined above.

Quite some time ago (May, 1954) we had a neat little rig described in CQ. The rig was a low drain, low power job, designed for mobile operation. At this time we had the 12BH7 tube. Today we have the 6CX8. By substituting the 6CX8 for the 12BH7 the output of the final stage increased, as we have much greater drive. We also use a 6BK5 instead of the original 6BA6. This also gives a good deal more "push" to the final. The further substitution of a 6360 for the 12BH7 final makes all the difference between getting out and not being heard. The earlier version was designed to work very well with low power consumption from the battery, which it did very well.

The new one is designed for POWER with the least consumption. Both transmitters have the same basic circuitry, that is a crystal oscillator on 8 megs. The triode section of the 6CX8 is an oscillator, while the pentode section is the tripler to 24 megacycles. This drives the grid of the 6BK5 as a tripler also, and the frequency of this stage is 72 megs. As this is a double ended circuit (see diagram) it is possible to drive the grids of the final tube in push pull on 72 megs. As the final has both plates tied together, the output is *push push* and comes out on 144 megs.

There is some controversy regarding this circuit. Many claim that it is a doubling circuit or puts out on the harmonic principal. In the case of a push-push circuit this does not hold true, as follows: Each grid is driven on 72 megs. Each plate is tuned to 144 meg. As the separate grids are driven on 72 megs, the plates put out on 72 megs, BUT, the combined output from both plates is 144 megs. In other words each side pulses through and contributes 72 megs of RF to the total additive output of 144 megacycles. I hope that this is clearer than it sounds . . . it is correct and works out all OK.

Now to business. The 6360 final stage is rated at up to 18 watts carrier, for 144 megacyle operation. This little job darn near does it too! If you take your time and build it correctly (short leads, etc.) our claim to ten watts on two meters should be conservative. When on 75 meters, the output should be in the neighborhood of 15 watts, again conservative. This gives you a good all purpose mobile rig of good range. And many times you will not be able to contact on 75, but good old two meters will push right thru!

If you look over the diagram carefully, you can get the general idea of operation better than words can tell. As you can see, XTAL circuit is a simple one with the XTAL connected from the plate to the grid of the oscillator tube, with a blocking condenser to protect the crystal.

You will notice a bypass condenser connected from the B plus supply end of the first tripler coil to ground. If this condenser were to be removed, then by inserting a 75 meter XTAL (3850kc) into the circuit the 75 meter signal will go straight through to the grids of the final tube! The removal of this bypass will make the first stage into an untuned circuit, and anything will go through. The small fact that a few little variable condensers and adjacent two meter coils are still connected to said circuits means nothing at 75 meters. They might add a little capacity to the circuit as a whole, but a little less capacity in the 75 meter TUNED circuit and all is the same!

If we now add a 75 meter tank coil in series with the two meter choke from the final stage, we will find that the final is on 75 when driven on 75, and is on 144 when driven on 144! (With bypass restored). In other words, by removing the bypass and changing xtals, we are on 75 meters. And by replacing the bypass (with a switch) and changing XTALS (with a switch) we are once more on two meters. The method of connecting the antenna is quite efficient and it does not detract from the two meter circuit (while at the same time, it still puts out heavily on 75 meters). The 75 meter antenna is tapped about ten turns up from the bypass end of the final 75 meter coil, and it runs through a .005mf condenser, which keeps the dc off the antenna. At the point where it connects to the two meter link circuit to the antenna, the link is bypassed to ground also, to tune out the reactance. Look over the diagram, getting acquainted with the purpose of each stage before you attempt to construct the rig, and then lay out your parts on the chassis. Lay the coils, etc. there also, and arrange parts such that they lay with VERY

Continued on page 33

# Toroidal AC Line Filter

**E. H. Marriner, W6BLZ**
**528 Colima Street**
**La Jolla, California**

A fact often neglected for the prevention of TVI is the use of a good AC line filter. Conducted R-F can be successfully stopped using a filter in the AC line. Amateurs go to great extremes shielding their transmitters, using low pass filters and never think about using a filter in the AC line.

The harmonics coming out on the AC line from the transmitter may be conducted for several miles and feeding into TV sets all along the line. Very often conducted noise is contained within the line and cannot be detected by ordinary means and the line must be fed into a receiver or measuring devise to locate the offending harmonics, if they are present.

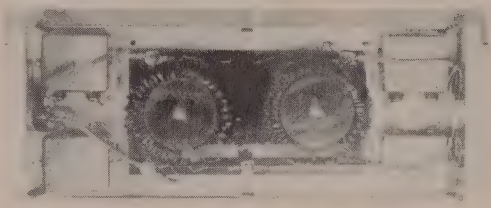
Old fashioned line filters were constructed winding enamelled wire on broomstick handles. Modern techniques use toroid cores, which have a higher Q, will fit into a smaller space for packaging and the shielding does not affect the inductance and Q like the air wound type.

The first difficulty in using Toroid cores is trying to locate them. New ones are sold by Western Electric and can be purchased direct. Yet I have seen boxes full of toroids in surplus stores being disposed, because no one knew what to use them for. Mostly these coils were stamped RET for retarder coils. The wire and cloth tape could be cut off and the cores re-wound with heavy wire.

Perhaps this artic[illegible] will give some of the dealers a chance to [illegible]il some if they have them around yet.

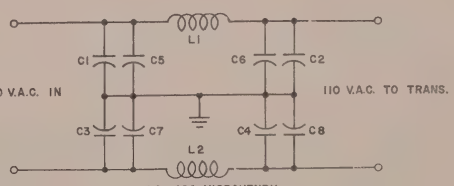
I have shown in Fig. 1 the largest size filter an amateur would probably need. It will carry 10 amps at 117 volts AC to KW rig. Smaller coils and wire could be used for a smaller sized rig and made into a much smaller box. This idea of using toroid line filters might stimulate some enterprising manufacturer into putting a line of these filters on the market or help the surplus dealers find an outlet for the cores.

The type number stamped on my core is an old Western Electric number P-475866 which can be cross referenced by writing to them for the new numbering system.



It takes 4 of these cores because two each are stacked together for each coil. They are then wrapped with glass tape, the #10 of 37 turns wrapped on and some type of tape on top of the wire to hold it in place until they can be dipped. Linen cloth is used considerable for this purpose. The coils can be taken to a local electric motor repair shop which will dip the coils in electric motor varnish for a slight charge. Beeswax would not be good because of the melting which would take place if the wire tends to heat because of the current drawn.

Now days most all military and commercial transmitters now use line filter to be within conductive radiation specifications set up by Govt specs. I think the amateur would do well to follow in their foot steps and install AC line filters if they expect to have a perfectly clean transmitter installation.




L1, L2 - 420 MICROHENRY TOROID
C1, C2, C3, C4 - .002 MFD SILVER MICA
C5, C6, C7, C8 - 1 MFD, 600 V., OIL FILLED

**PARTS LIST**

Core type:
Western Electric, 195 Broadway, N.Y. C., N.Y. Type P-475866 (Old number) The numbering system is now different. Molybdemn Permalloy material 3.063" x .500 high.
If you live near L. A. call Arnold Electric Co., 3450 Wilshire Blvd. LA 5 and they can help you locate these coils. If you live on the East coast writ direct to WE.
Surplus dealers check your stock.

LMB Box
#18 5½ inches by 13 inches, 2⅝ high. Each coil wound with #10 wire 37 turns comes out at 420 uh which is not critical.

Condensers:
Use good Oil filled 1 mfd 600 volt surplus type. Put a .002 mfd Silver mica across each one. .001 mfd will also be satisifactory

# THE TA2 SPECIAL

IN TWO PARTS

**CDR C.M. Sturkey Jr. USN, W7TNA**
**Qtrs. 599, Puget Sound Naval Shipyard**
**Bremerton, Washington**

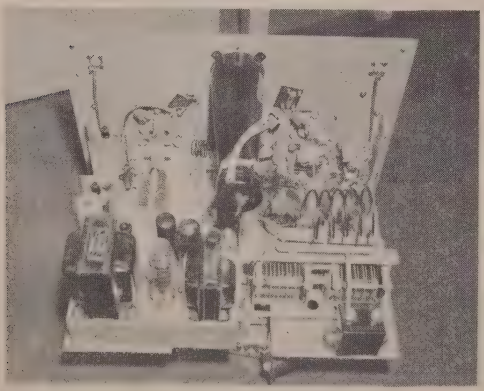
Part One, the theory behind this transmitter along with the relative merits (and lack of same) of the various forms of emission.

The reason for the title will remain obscure for the present. Primarily it is a device to encourage you to read further. My interest in preparing this little article resulted from a recent round table with VK3JK and W7IAA. These two were using SSBSC and I was using DSBSC (double sideband suppressed carrier). After giving a brief run down on my "home brew" DSB rig, pointing out its simplicity both from the standpoint of construction and adjustment, and taking several deep bows as a result of the compliments passed on the sharpness and quality of my signal; the subject of the conversation got around to a discussion of the difficulties confronting the average ham who wishes to get started in SSB.

Because of the ample availability of excellent "store boughten" amateur SSB transmitters in this country, well-heeled U. S. hams have no problem. However, it might come somewhat as a shock to some who have heard the many KWS-1's, KWM-1's, HT-32's, etc on the the bands, that the average U. S. ham cannot afford this kind of equipment. The dwindling group of "home brew" artists also have their problem with SSB. Assuming that they have a better grasp of technical know-how than the average, the cost of acquiring the necessary test equipment is often prohibitive. For most hams outside of the U. S. the problem of getting started in SSB is a much more serious one. Do not misunderstand me—I am not running down SSB or discouraging you from giving it a try, but only pointing out why there are not more on the bands, who are taking advantage of this wonderful medium of communication.

All you hams who are obsessed with a suppressed desire to talk back to the "Donald Ducks" should not be discouraged. The

CDR C.M. Sturkey Jr.first built this multi-emission rig while stationed in Turkey (TA land) in 1952. As a naval advisor at the Turkish shipyard near Izmit, he found time to operate as TA-2EFA, and as he says, had the 'doubtful' honor of turning in the top Turkish score in the DX contest. It would only be fair to tell you that he was the only TA entered that year. Now stationed in Bremerton, Washington, Charles can be found cutting a mean hole on the high end of 20 meters almost nightly, as W7TNA.



The complete TA2 Special, one kilowatt DSBSC, audio driver stages, and final all on one chassis. Towards the panel on the left, the pair of 6146's which drive the hefty RK-65's,. At the rear left, the 6L6 audio section, and a low voltage supply. On 75-80 meters, both sections of the split stator variable, and the 100mmfd fixed capacitor are used to bring the tank into resonance.

"TA2 Special" is the solution to your problem. Not only can you work the SSB boys without a word of apology for your signal, with this transmitter it will not even be necessary for you to sever social intercourse with your old friends on the CW and AM.

If there is anything original about the "TA2 Special" it is that it combines the features of DSBSC transmission which has recently received much attention by "CQ Magazine" and DSBRC (double sideband reduced carrier) which was covered in QST (2) by a two-part classic by George Grammer in 1951.

Figure 1 is a simplified circuit of a proposed medium-powered version of the "TA2 Special". Most will notice immediately that basically it consists of a balanced modulator plus a grounded grid linear amplifier. While the grounded grid linear provides a very efficient and fool-proof way of increasing power output, it is not a "must" as a balanced modulator can go directly to the antenna. By using heavy duty pentodes or tetrodes with proper characteristics (ones requiring relatively low screen grid voltage would be preferable), it is possible to get a high-level output without the linear amplifier. Looking at Figure 1 again, it will be noticed that the modulation transformer has a secondary. This makes it possible to apply separate screen grid voltages to the two tubes. In position 1, both screen grids are at DC ground potential. With approximately balanced components and tubes a carrier suppression of about 40 db's will result. When audio is applied to the screen grids, DSBSC is produced. In position 2, a postive voltage is applied to one screen grid and an equal negative voltage is applied to the other, this gives DSBRC.

I will not go into too much detail on DSBRC because those interested should check their back files of QST to read George Grammer's articles. However, here is a somewhat oversimplified explanation. In the absence of audio, the tube with the negative screen grid voltage is effectively removed from the circuit except for the fact that it continues to act as an excellent neutralizing condenser for this stage. The tube with the postive screen grid voltage operates as a class "C" amplifier at reduced efficiency. This is because of the relatively low screen grid voltage being used. From this it may be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1.a. Costas, J. P., "Single Sideband Is It Really Better Than Amplitude Modulation?" CQ, January, 1957

1.b. Webb, J. K., "A Synchronous Detection Adapter for Communications Receivers," CQ, June, 1957

1.c. Harris, D. S., '.DSB Considerations and Data," CQ, October, 1957

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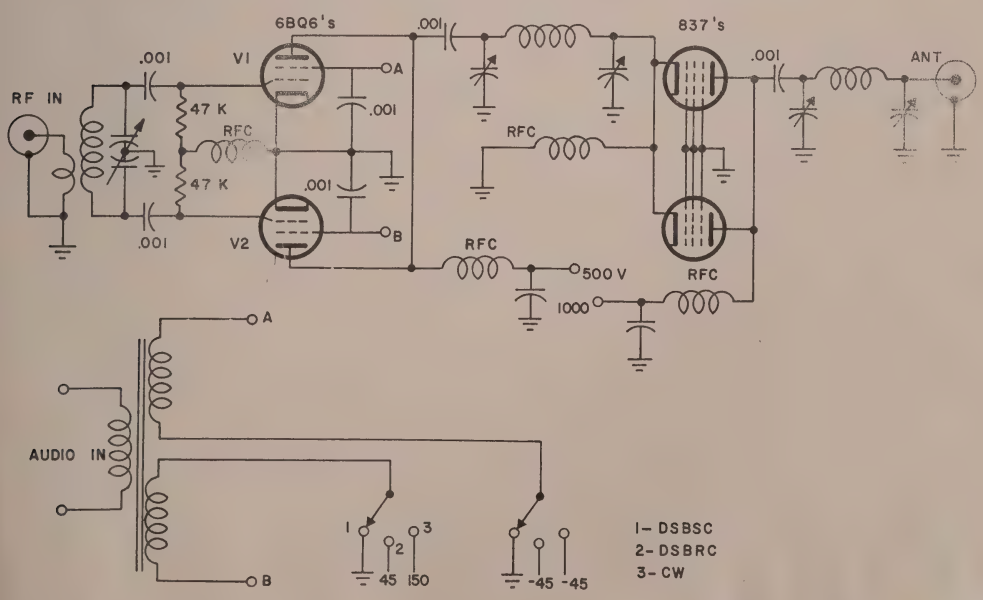
1.e. Najork, Jack, "A 100 Watt DBS Mobile Transmitter," CQ, March, 1957

1.f. Stoner, D. L., "Double Sideband with the Heath DX-100," CQ, April 1957

1.g. Jonas, F. C., "Low Cost DSB-AM Amplifiers," CQ, November, 1957 X

2. Grammer, George, "DSBRC" Part I and II, QST, May and June, 1951

seen that the amount of carrier developed depends on the screen grid voltage applied, always keeping an opposite and approximately equal voltage on the other screen grid. Up to the point of 100% modulation this stage performs like a conventional single-ended screen grid modulated transmitter. When 100% modulation is exceeded, the tube with a negative DC voltage on the screen grid starts to work. Assuming theorectically perfect tubes, if we use 50 volts positive on the screen grid of VI, 50 volts of audio would give 100% modulation. up the load. Figure 2a shows 100% modulation using the 50 volts of audio as per example above. Figure 2b shows the overmodulation that would result with a single-ended stage under the same conditions with 100 volts of audio. Figure 2c shows the results of 100 volts of audio with two tubes operating in a "balanced modulator".

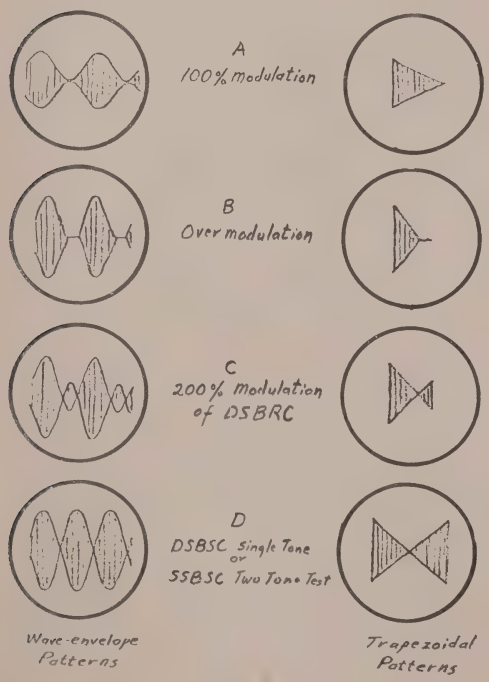



Fig 2 Oscilloscope Patterns

Even though we also are applying this audio to the screen grid of V2, nothing happens because of the positive swing the 50 volts of audio substracts from the minus 50 volts of fixed DC giving us zero voltage.

Now consider what happens when we increase our audio — say 100 volts of audio is being used. On the positive swing — the VI has +150 volts and V2 has -150 volts. When the audio voltage reaches the peak at the opposite swing of the cycle VI will have -50 volts and V2 +50 volts. At the point when VI stops working V2 picks

While we are on the subject of oscilloscope patterns we might take a look at the presentation resulting from DSBSC signals. It is interesting to note that with single sideband transmission it is necessary to use two tones to get this presentation, but only a single audio tone is necessary to make this check with DSBSC. Figure 2b shows what you will see with good carrier suppression (approximately 40 db). The presence of excessive carrier shows on the wave-envelope pattern as a difference in height on two adjacent peaks, with the "bow tie" or trapizoidal pattern an unbalance in height will be noted.

The above explanation is only an effort to help you understand what happens in this circuit. Even though you may not understand all of this or may not have even seen an oscilloscope, there is no reason why, by following a few simple ground rules, your end product can not be good.

It has always been a source of amazement to me that following the articles in QST in 1951 on DSBRC there was not an immediate interest developed in this new technique. On paper it looks like the answer to the phone man's prayers. At this late date, however, I believe that I know the answer. Those few of us that tried DSBRC in an effort to obtain peak efficiency operated in the 300 - 400% modulation range. At this level, except when the fellow receiving the signal uses a crystal filter or Q multiplier in a sharp position (this exalted carrier's reception restores the unbalance between the carrier and sidebands) the audio distortion is quite pronounced.

Recently I have accepted a reduction in over-all efficiency and have operated mostly in the 200 - 300% modulation range. At this level even with the usual receiver IF's (6 - 12 KC band width) distortion is negligible, or at the worst, acceptable. I should add here that the use of speech clipping is an important factor in reducing distortion. When using DSBRC most stations worked, even before being given information on my rig, remarked on the audio level being high in comparison with the carrier.

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# attention SSB Experimenters

E. H. Marriner, W3BLZ
528 Colima Street
La Jolla, California

A phenomenal linear amplifier was described at the SD Convention by Norm Roller, W6EDD. I have constructed the low power model using a 6DQ6 GE tube and it works. According to Norm his circuit is a modification of a ZL circuit. The RK-65 at W6EDD's station is on the air using this method of a gated linear amplifier.

The final in the resting condition does not draw current because the screen voltage is low. As soon as excitation hits both the gate tube and the final amplifier tube, the screen voltage goes way up, letting the signal out on the air with a wallop. A normal 400 watt rig puts out like a KW - I mean it does put out a KW.

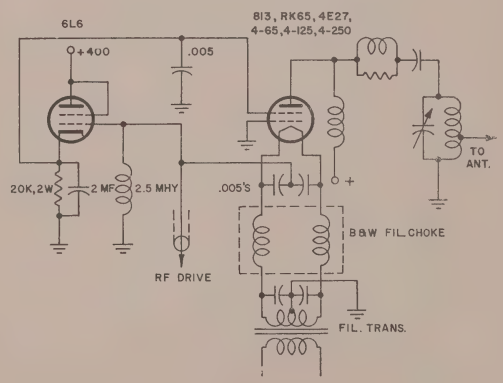
The Grounded Grid circuit shown in fig. 2 is good from the stand point that no bias voltage or other circuitry is needed. The lower power (fig 1) circuit uses resistor bias which will have to be adjusted depending on which low power tube is used. The input power can be coupled in to the grid coil with a few turns of wire from the exciter. Here are a few notes:

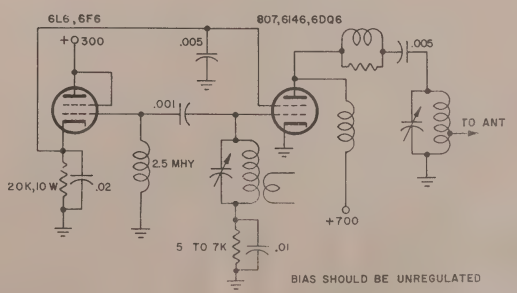
Gate tube: Use only the 6L6 or 6F6 because of high transconductance and low grid to cathode capacity. It has to carry 25 to 30 ma maximum, and must not load your driver, thus the 6L6 and 6F6 are the tubes to use. A 6Y6 doesn't work too well. The screen voltage must be under 50 volts and the bias should be adjusted so that the tube is not cut off and non linear. If you use a non regulated supply instead of the grid resistor, set the resting current on the tubes to 1/3 their rated plate dissipation. This would be around 4 volts bias. The idea is to keep the grid current swing from being too high. For higher power rigs use the grounded grid circuit shown in fig 2. 2000 to 3000 volts on the plate for 1 KW input with about 30 watts of drive will be all you need.

1. Grid Current 30-50ma, pr. tubes
2. Screen Current: 30-50ma, pr tubes
3. Plate Current: 330 to 450ma
4. Screen Voltage resting: 60 volts
5. Screen Voltage full drive: 300v
6. Average Screen voltage: 180v

Norm sez: No TVI and only takes about 30 watts to drive the Grounded Grid amplifier to a full gallon which is much less than other GG systems. Note Neutralizing may be necessary with most tubes, and you better take it in to consideration when you build the lower powered circuit in fig. 1.

Anyone building one of these amplifiers, we would like to know how you like it and anything else of interest that we can pass along to the rest of the SB gang. How does the idea sound to you? Be sure and let us know. 73, W6BLZ for Norm Roller, W6EDD



Danny examines turtle skull during Aves Island trip. Metal Venezuelan flag has a 'permanent' wave

# DX report

Dick Spenceley KV4AA
Box 403, St. Thomas
Virgin Islands

CE3AG writes that the Juan Frenandez expedition has been delayed until around January 25th as occasioned by repairs to the Chilean Navy transport "Presidente Pinto". Hope they made it! Hope you gottem! (CEØZA, CEØZB)

FD8DZ appeared, as scheduled, from Togoland on January 10th and 11th and did an able job on SSB and CW. Ops were 9G1CX and 9G1CF.

The YASME II Expedition edges towards its completion of West Indian DX spots with Danny's appearance at Dominica as VP2DW. He was assisted by Bob, W8DVJ/VP2DX, as 2507 contacts were made between December 23rd and 28th. On December 31st YASME sailed for St. Lucia with VP2DJ and VP3DX along for the ride. Danny obtained the call of VP2-LW and was in business by January 2nd. Some 2900 contacts were made before the big switch was pulled on the 10th At 10 PM, January 13th, Danny set sail for St. Vincent and arrived there at 1 PM the 14th. The schooner "Water Baby", which made acquaintance with YASME at Aves Island and again in Antigua, was again encountered off St. Vincent. This time it had engine trouble and YASME towed it into Kingstown, St. Vincent. Danny should have been on with a VP2S—call by January 16th.

Last port of call in these waters will be the island of Grenada where Danny should be QRV about January 30th. Danny will then return to KV4-land for final refit towards the long Pacific voyage. Estimated departure for Panama should be around March 25th. Thus, the YASME has covered ALL the new West Indian islands outlined in June QST as "new countries" except Jamaica, which is fairly well represented ham-wise. He has done a "bang-up" job and wishes to thank all of you whose contributions have kept the trip "cracking."

YASME II returns from Aves, to St. Thomas with quarantine flag flying (routine). At bow is Julio, YV3BS, Jules, KP4AIO adjusts fender while Danny is at the wheel.

4V9AA has been heard by W6NZW and has worked some W6's and 7's. Claims Nepal as QTH and QSL's via VU2RM or VU bureau QRG 7005 kc around 1500 GMT.

Letter to W2CTN from VR2DA that VR2DA and VR2DK may visit VR1, VR5 and other islands around January or February.

Home QTH of ZD8JP is: John E. Packer, High Knoll, Furze Close, High Solvington, near Worthing, Sussex, England.

We note from the papers that the free balloon, signing G7AA, which left the Canary Islands in December, has arrived in Barbados. Flight was maintained for about 1000 miles after which the balloon was forced down and the trip was con-

W1EJV visits KV4AA in 1958.

Get-together in Sweden includes (l to r) SM5ARL, SM5AFU, SM5AQW, SM5AQV. and SM5AOI.

tinued in the balloons gondola which had been fitted out as a boat. G7AA activity was slight.

K2IRO calls out attention to Cabinda as a candidate for a "new" country. This QTH is located just north of Angola and separated from same by a stretch of Belgian Congo. It is not known if any ham activity exists there at present.

VP2LU is now VP5FP on Grand Turks Island and promises plenty of activity.

New members of the Japanese IGY expedition should now have arrived at the Showa Antarctic Base. The Call JA1JG was used last year but it is expected that this years operation will use the prefixes 7J or 8J. ie: 7J1AA, 8J1AA.

F2CB/FC, on Corsica, has been reported on 7 mc CW.

Further word on the extensive Czechoslovak geographical expedition comes from OK1MB who states that OK1HZ suffered a broken leg but hopes to be in shape to start off by March 1st. First stop will be Albania.

YK1AT, Syria, has been reported active again, by W3RUT. He was heard on 14050 and 14305.

Ramalho, CR5AR, on Sao Thome Island, has been active on 14050 and 21075 cw. He gets on 14 mc at 0800 GMT each day and also around 2000 GMT. He is the Postmaster at Sao Thome and cards go to: Amarilio Ramalho, Sao Thome Ilha, Port, West Africa. He may have some W handling his cards by now. Calls to him should be of the 5 WPM variety.

FB8CD, now in Paris, is due to return to the Comoro Islands in February.

3A2AF (W6SAI) will be active from Monaco again in mid-January SSB and CW.

PY7AN say next trip to Trinidade Island will be in January or February and he will be signing PYONC. Mostly CW.

VP9LE, of Cocos-Keeling, returns to Australia in February.

K4SXO is QSL Manager for VP2SL.

FB8UU is on St Paul Island and has been worked on 14010 and 14008. He is counted same as Amsterdam Island, FB8ZZ.

We get many inquiries over the air saying "what island is VP2LW" etc., etc. It should be fairly well known now that the British West Indian Islands can be distinguished by the first letter following the numeral. Thus: all VP2V-stations are in the British Virgin Islands, all VP2K— in St. Kitts, all VP2A— in Antigua, all VP2M— in Montserrat, all VP2D—in Dominica, all VP2L— in St. Lucia, all VP2S— in St. Vincent and all VP2G— in Grenada. Anguilla Island is administered from St. Kitts and VP2K— calls are issued. Possibly all Anguilla calls will add an "A" on the end for identification as Danny got permission to do when using VP2KFA.

73
Dick, KV4AA

Looks like Jr. is hearing something good at K4LNM, Memphis, Tennessee.

Nope, WRØSAD isn't Lower Slobovia but the SWL call of Lav Kinney, in Detroit.

# SOME PRACTICAL EXPERIENCES WITH KNIFE EDGE REFRACTION

**Robert Grimm, K6RNQ**
**2323 Ransom**
**Oakland, California**

After reading several books dealing with knife edge refraction, I was surprised to learn that I "could not" employ knife edge refraction on 50 mc. over a path that I had been doing just that on for two years.

The phenomena of knife edge is rather fascinating. No path need be impossible no matter how bad it may look on first glance. A good example is a knife edge path from my QTH in Oakland, California to Reno, Nevada. This path crosses the Sierra Nevada mountain range at a point where the mountains rise 8,000 to 10,000 feet msl, across the Sacramento valley (average msl-60 feet) and thence across the "Oakland Hills" which rise to 1500 feet MSL.

My QTH is in the shadow of the Oakland Hills, with the angle to the hills in a northeasterly direction running from 5-10 degrees. I have been workiing into the Sacremento Valley area utilizing knife edge refraction for a couple of years. In the Valley, the area covered by this path runs from West Sacramento to Carmichael, Fair Oaks to Auburn, and on northeastward to Mount Rose and Reno, Nevada. It also runs to an as yet undetermined point NW of Sacramento. The path into Reno would seem to be an extension of the primary path into the Sacramento Valley. Here it is interesting to note whether the path to Reno is double knife edge phenomena, i. e. refracting directly from the Oakland Hills to the Sierra Nevada Mountains, or is there a ground reflection at some point near the path midpoint, between the Sierra Nevada and the Oakland Hills. I am inclined to suspect a ground reflection, because, under tropospheric conditions over the Sacramento valley the knife edge signal from Reno is somewhat attenuated, whereas if it were going directly from the mountains to the Oakland Hills it would be passing over the tropospheric area and remain virtually unaffected.

Identifying a knife edge signal from a tropospheric signal is comparitively easy, as the knife edge signal will be consistent day after day, wheras a tropospheric signal will tend to have a slow fade (Eds. note. Or fast fluttery fading) and considerable variation will be noticed on a day to day basis, as well as on an hour to hour basis. Tropospheric bending is also more pronounced during the early morning hours, around sunrise. The interesting point about this occurence of double knife edge is that it is workable from both ends of the path (i.e. Reno to Oakland, and vice versa) as well as the middle, i.e. Carmichael, which is the approximate midpoint. Carmichael is located 10 miles NE of Sacramento, and K6ERG, located here, is able to work both K6RNQ and W7MAH, seemingly on knife edge, in opposite directions.

The extremely spotty nature of this mode of propagation is also quite interesting. At Oakland end of the path the area of reception is roughly triangular in shape and extends to a point approximately two miles west of the Oakland Hills, where it is at this point 1.5 miles wide, funneling down in width as it approches the hills. Signals from the Sacramento valley that are to be propagated by this mode appear to cover the areas of Concord (directly towards Sacramento from K6RNQ, about 35 miles along the path) to West Sacramento in Yolo County as far east as Mt. Rose, Nevada, and the southern end which has not yet been defined clearly, but which appears to lay about half way between Sacramento and Stockton. The Oakland end of the path was determined by using Television station KCRA, channel 3, Sacramento as a signal source. The writer is a television technician and checking the extent of the KCRA coverage in Oakland was comparitively easy to do. How wide the reception area is at the Reno end of the path is also not yet determined, but appears to be far from optimum and calculations show that the path should extend to a point about 30

Continued on page 31

# VHF Record

Robert Cooper, 820 Tully Rd. Modesto Calif.

**to VHF RECORD, from Rick Emerson, W3OJU:**

Reviewing briefly what has taken place in the past several weeks, in regard to the FCC decision to allocate 50.9-51 megacycles and 147.9-148.0 megacycles to exclusive CW sub band use, we find that literally thousands of telegrams, phone calls, letters and personal visits have ascended upon the FCC's Washington, 25 D. C. office in opposition to the proposed rule change. Supporting the FCC descision to make sub allocations, but not in the 50.0-50.1 and 144.0-144.1 segements recommended by the ARRL and other prominent groups, were CQ magazine and thousands VHF ragchewers who were primarily aroused over the chance of loosing 100 kc of prime rag chewing territory. Opposed to the new 50.9-51 and 147.9-148 segment we have the ARRL's VHF and legal staff, and hundreds of weak signal propagation and DX enthuiasts more concerned about hearing weak signal DX and the proper use of CW in the VHF bands, than with rag chewing with the fellow across town. The FCC proposed rule change making 50.9-51 and 147.9-148 exclusive CW segments was to have taken effect January 10, 1959. As far as most hams are concerned, that is how the matter stands at this date.

However, through Rick Emerson, W3OJU, Washingtton, D. C., and the ARRL, we learn of the following late developments in this field. The FCC proposed CW segments did not go into effect January 10, as planned, and have been delayed until the FCC can re-consider the proposal in light of four brand new petitions now pending at the FCC office. One of these petitions delay the instatement of the CW sub allocations until the other 3 proposals are considered, and a final descision is reached. The most important proposal of the three suggests that the technician class licensee be given operation of the two meter band, in EXCHANGE FOR WHICH the thosands who opposed the ARRL 50-50.1 and 144-144.1 exclusive CW segment petition would withdraw their complaints thus allowing the serious workers the chance to use the lowest 100 kc in each band for CW only. In short, brief, and not too flattering terms, the powers that be have deemed the "lowest 100 kc CW segment" proposals so important that they are willing to *buy off* the opposition (in this case, thousands of technicians, mainly.) by granting them privileges in the two meter band. This is probably the most amazing proposal to leave league headquarters and come before the FCC in over a decade.

It has at least been demonstrated that the league does not and can not always get their way at the FCC office. And, it has demonstrated that thousands of letters "still make an impression" upon the FCC. It would be most interesting to learn what percentage of the opposition to the initial ARRL petition do not hold membership in the league.

*TWO METERS FOR TECHNICIANS?*

When the FCC was presented with a petition to allow the Technician class licensee the use of the 50-54 megacycle segment known as six meters, six meter activity was at an all time low. There was genuine fear at league headquarters and in the amateur ranks that the six meter band would be confiscated for commercial or industrial use, because of non use by the amateur clan. By granting the Technician licensee the use of the six meter band the FCC has allowd literally thousands of amateur license holders to get on the air, as beginners, as few newcomers could get gear going on 220 and above. And to the newcomer, the lack of activity and lack of contacts on 220 and above did anything but attract serious interest in the UHF bands.

At the time of the proposal (summer of 1954) some serious thought was also given to allowing the Technicians the use of both two and six meters, thus making it a "VHF Class" of license. However, the general feeling around league headquarters and throughout the country was that giving Technicians both two and six would defeat the "save six" principal, as the Technicians would naturally migrate to two meters, where the activity and contacts existed. And six would continue a dead band.

However, now the league can dangle the use of the two meter band bfore the nose of the hungry Tenchnician who is dying to conquer new worlds (as long as the new worlds can be conquered with a Gonset Communicator) and win the next VHF contest by operating on both two and six. What will happen? It is quite literally up to you, the "hamous populus", to impose your golden judgement, once again, upon the FCC office. You have until March 10, 1959 to file comment. Do you want the Two Meter band? (Write to FCC Office, Amateur Division, Washington 25, D. C., with your comments and the box top from one Gonset Communcator).

*WE VISIT THE FENWICKS*

Most six and two meter inhabitants in the San Francisco Bay Area are aware that two of the W7CMP trio are now operating portable six from Stanford, California, where they are attending the EE school. Actually present at Palo Also are Dick (W7VMP) and Bob (W7VMQ). Having never met any of the famous trio, and finding myself located in Palo Alto on the evening of January 20, I paid a visit to the famous Fenwicks.

I was not too surprised to find them busily engaged in writing up Heathkit's newest entry into the amateur field, and their first attempt at VHF, the Seneca. From the serial numbers, etc. stamped all over the thing, it looked to be one of the very first out of Benton Harbor. To your editor, it's one heck of alot of rig for $169.50. The string and gear drive assemblies are a marvel of complexity, there being just one direct drive shaft in the whole rig! The VFO is built and enclosed on a sub chassis to prevent heat from affecting it as the final and other tube sections warm up. The multiplier chain is also built on a seperate sub chassis. Good quality parts appear to have been used throughout, and the

boys will undoubtedly have it on the air before this appears in print, if the final tank assembly arrives from Heathkit (missed in assembly). Maybe we can get Dick to give us a brief run down on its operation next month.

Bob was home (Phoenix) over the Christmas holidays and found six in the doldrums, as far as F2 was concerned. He did manage to work a Nebraska station on backscatter from the east one day, and heard the KH6's on two ocassions, however. On the evening of December 26 double hop Sporadic E mixed with single Es and brought in W5 and XE1PFE, TG9JW and T12AFC.

*W9KLR REACHES 41 STATES ON 144 MEGS!*

Bill Rose, W9KLR, Rennelaer, Indiana has pushed one step closer to the impossible, the 144 megacyle WAS. Bill has worked virtually every state within range, with the exception of Arizona, Utah, Wyoming, and Idaho, on 2 meters. In these states, lack of activity in the right spots seemed to be the limiting factor. Determined not to allow a small factor like no activity curtail his quest for 144 WAS, Bill has put together a portable rig consisting of ARC-5 delivering 22 watts output, and a 32 element UHF Resonator beam. An accessory power amplifier using a pair of 4-65A's is also available if needed. The 22 watt portable rig was packed up and shipped to Bob Lane, W7UFB in Casper Wyoming, in time for the Quadrantids Meteor Shower, January 2-5. Prelimnary checks showed "good detectable bursts" coming through from the 22 watt rig, so no attempt was made to ship the 465A's to Wyoming. A partial QSO was completed on January 3, with one burst overloading the tape recorder at W9KLR. A good 30 second burst at 0454 on the 5th allowed a complete exchange and W9KLR had number 41! As Bill says, have 4-65A's and *they will travel.*

*220 MEGACYCLES:*

Not all of the record breaking attempts on this band are to be tried on the coast this summer. W7RUX, Phonenix, has a kilowatt rig with a pair of 4X25OB's working now, and 4 stacked 11 element long yagis (44 elements) will be on the tower when the weather clears. Don (W7RUX) has recently acquired the "Fenwick Kilowatt" rig on two meters, with associated power supplies, modulator, and six meter final. This should put W7RUX in the truly stupendous class with kilowatts on 6, 2 and 1¼ meter bands!

But W7RUX represents at best just one end of a circut. Who, where, is going to give Don something to shoot at? Pull out your map and measure off the 1080 mile distance between Phoenix, and Shreveport, Louisiana. That's where Martin Colvin, W5KTD, is busily engaged in building up a "Reactance Amplifier" for 200 megacycles, after having gotten his 144 megacycle specimum working to the point that he cannot measure the noise figure . . . its that low! Anything he does adds noise to the circut . . . antennna included. The transmitting end at W5KTD is held down with a single 4X250B at 200 watts. Meteor Burst schedules with W7-RUX will begin this spring.

*ZLs LOSE 50-51 MEGACYCLES:*

Word has been received from ZL2AGD stating that "As from January 1, 1959, the ZL's lose 50-51 megs. The 51-53 meg. section will still be available on a shared basis. The government is starting t.v. experiments on 54-61 megs. during 1959." So fellows, re-peak your converters for 51-53 megs this spring and give a listen, the MUF did rise that high on several occasions last spring, on the W-ZL path. Who will make the first two way with a ZL above 51 megs? (Note: Its pure speculation on my part, but some of the ZLs may not "choose" to abide by this ruling, especially those living in outlaying regions. So do not neglect 50-51 until you have worked them above 51.)

*VK's TO USE 50-51 CW ONLY . . GENTLEMEN'S AGREEMENT*

VK3ALZ notes that a gentlemen's agreement is currently receiving much favorable talk in VK 50 meg circles . . . an agreement which will leave 50-50.1 open for CW only in Australia. This is the result of last springs VK-W openings during which many VK's heard W-K stations on numerous occassions but could not raise them Watch the first 100 kc for VKs on CW this spring

*KR6 (OKINAWA) STATIONS ON 50 MEGS*

From VK3OF we learn that three KR6 stations are now on six meters. KR6AF commenced skeds with a vee beam aimed at W land, 50.1 mc., 1500-1530 PST, November 30 with alternate 5 minute periods of transmitting and listening. KR6AK on 50.120 and KR6BS around 50.1 alson came on around December 15.

*VK5 BEACON:*

Application has been made with the VK FCC bureau by the VK5 Amateur Bureau (South Australia to run a 500 watt beacon station into a vertical radiator on a continous basis, on 50.750 megacycles. Although it might benefit we W's more if it was lower in the band, we still may hear it this spring.

W6FZA, Porterville, on 220.049 megs:

Alan has 60 watts output on 220 megs now, CW or phone, and is ready and waiting for schedules. Contacts have been made with a half dozen or so LA basin stations at last word. Polorization is horizontal.

*RED TAPE, CS3AC AND STUFF:*

If you have been reading the column carefully, you noted that K6UZK and K6EDX had plans in the jelling form to operate from CS3AC (Azores, which counts as Europe) during mid January. Transportation and equipment problems were about ironed out when a monkey wrench in the form of Red Tape in obtaining the license came from Lajes field, Azores on December 12. It is apparent that we could have operated with the approval of the Portuguese Government. BUT. not as an amateur radio station. Scratch one!

October 26 . . . Un-identified VK5 . . .

Remember that un-identified VK5 K6HMK, RNQ and W6SUE heard testing from 1322-1345PST on 50.045, October 26? Word of the W reception was spread over VK land by the Wireless Institute of Australia (W.I.A.) and VK5BC responded like a trooper. He had (past tense) the habit of arising around 0645 CAST and turning the rig on, testing with AO carrier, signing a muffled call, and swishing across the band a few times before coming back on. Needless to state that his operating technique during testing periods has improved markedly since that time.

*WHAT'S HAPPENED TO SIX METERS?*

Well it finely happened. The bottom fell out of the MUF around December 10, and the band hasn't been the same since. The sun spot count from the National Bureau of Standards was down to zero the first two weeks of November, and the great number of spots usually present have dwindled to two or three in the past few weeks. Six has opened to the east coast briefly on several days in January, although not at all up to its old self. W1,2,3,4,8 and 9 were worked on the 17th for the last good opening as we write. Actually, it was the only decent opening noted since December 7. The VHF Record is most interested in soliciting your observations on how the band has changed from your QTH. What say?

*KH6IJ REPORTS:*

The king of the high speed contest on the DC bands drops us a note informing readers of WRA what can be done by a trained operator during a good six meter F2 DX session. Quoting Nose, "The enclosed is belated news of a last fall open ing, but it shows what a typical opening looks like for a contest man. There were a number of W1's who couldn't be broken talking to each other, and a VE1 whom I forgot to log thinking I'd catch him later, but he faded into the QRM. I have an automatic keyer on 50 mc and 144 mc but so far no luck."

Nose also comments that he will be on during the ARRL DX contest (Last phone section, March 6-8, last CW section, March 20-22) and will be looking for 50 megacycle contacts. Oh yes, the belated news Nose mentions includes a list of 52 W-K stations worked in the 2,3,4,7,8,9 and 0 call areas between 1005 and 1205 HST on November 27.

Australian News:

Quoting from the VHF section of the WIA News, "How frustrating can this band be? Ask Albert. VK3PG. Around noon December 10 he listened to three W6 stations in a natter session, signals to fair, but conditions packed up before he could join them." So gang, whoever and where ever you are, try tuning the band a little more and doing a little less complaining about lack of DX conditions. December 10 around noon EAST would be December 9 here, around 6-7 PM PST. Granted . . . who would expect DX from VK in December, at 7 pm. PST?

The VK-JA path folded up around December 1 and hasn't been heard from since. It would appear that the VK-JA fall path (fall our season, spring there's) would be true F2, while the VK-JA work likely to be done during our Spring (their fall) will be TE.

The VK6 boys (Western Australia) are planning a DX warning beacon to operate on 50.5. Ten watts into stacked Halos is planned. From this, and the planned beacon in VK5 (South Australia) it is possible that the VK's may be able to retain use of the 50 megacycle band on an unlimited basis. Just what is planned for the 50-54 megacycle segment in Australia has never been said, although tv operation is planned for 60 megs up. Currently VK's have operation on both six and five (56-60) meters and many enjoy crossband contacts when DX conditions are good.

*SPRING TIME*

T'is the season when thoughts of ZL's and LU's dance lightly in our heads. TE is back, and F2 condx to the South Pacific are picking up again. A backscatter opening from the SW (beam headings . . . 210 degrees, from California) was in evidence February 11 from 0953-1050. California stations worked other California stations, and really long haul stuff like K2KGH (who was 599on CW), W-K4 and W5 were sprinkled through the band for those capable of working CW. As George (W6OKR) says, there were lots of weak phone signals, if they would only go to CW we could make many more contacts.

A red hot opening to KH6 was noted on February 9 with KH6CCZ. CTC/KH6, UK IJ, AR, PP NS and one with very poor audio noted here in Modesto. With the exception KH6NS and KH6IJ, Arizona W7's and California stations seemed to be fair play for the day. NS and IJ did chase a few W9's and O's late in the opening, which began around 1030PST and finally quit at 1230PST.

ZE2JV popped through on January 31 around 1005PST and was worked by W6OKR, K6HMK and W6MMX in that order. This might have been the last shot at Africa for the west coast during this sun spot cycle.

East Coast 50 megacycle openings have at last dropped to the level that the CRPL charts have been predicting for over a year. The W1-4 stations have been making it to the west coast about two days a week of late. Surprisingly enough, all of the openings seem to be concentrating during the weekends.

About the time this reaches you 50 megacycles should be busting open with F2 to South America (0730-1240PST), Australia and New Zealand (remember ZL's are on 51-53 now), 1200-1700 PST, and Aurora (1700-0100). We know from past experience that as the Sun Spot cycle is receding the number and intensity of magnetic disturbances (and the resultant auroras) increases. There is every indication that Auroral openings will peak this spring, which should mean lots of fun for 50 megacycle men, and a chance for someone to make the first 144 meg auroral contact from California.

*SOUTHER CALIFORNIA GOES 220 HORIZONTAL:*

A note from Jay Bush, K6OPD, advises us of the current status of activity on 220 megs in Southern California. Jay notes that the entire area is changing to horizontal and he expects that complete change over will be accomplished by March 1. Hopes are held that this will encourage 220 stations in Northern California to give a try to schedules with their southern compatriots. Jay is working W6FZA. at will with 59 plus signals both directions on phone. He would also like to establish an universal DX calling frequency (such as 221.0 megs) which would help stations in fringe areas establish contact with metropolitan stations.

(EDs. Note: I for one will be willing to have a try at schedules as soon as I get the tower moved to the new QTH Jay. Modesto to Lancaster shouldn't be too tough a shot.)

Late News Flash: The FCC has extended until March 31 the last date for filing on the proposed petition to allow Technicians use of the 144 megacycle band. It has been demonstrated that the FCC does pay heed to mail so here's your chance to be heard gents.

73 . . de Bob, K6EDX 30 30 30

# Loupin The Loop

By Corky W6ORS
1833 Vega St. Alhambra, Calif.

Ye Editor/publisher called and sez it's time for another issue of Western Radio Amateur, so here goes for another month. I see that missing of a months issue that the ol' mill stil works as good as ever, and that the information is still available around the loop to the following extent.

Most activity around these parts is with the up-coming ARRL SoWestern Div convention to be held in Pasadena the last weekend of July, the 24th to the 26th. The RAMONA RADIO CLUB and the SAN GABRIEL VALLEY RADIO CLUB have joined forces to put on this annual event in the ranks of hamdom. Dr. Henry Richter W6VZA has accepted the General Chairmanship for the fete, with Ken Gulley W6ZPM and this op W6ORS as the Vice Chairmen. If things keep shaping up as they have so far, it could prove to be the best thing held in these parts in many a moon. Many activities have been planned to interest young and old. Director Ray Meyers W6MLZ is right on top of the operation, and assures all that it will really be sumpin' . . . Heard that Don Wallace W6AM has had a bout with the local hospital. Hope that it wasn't from RF burns, OM . . . Also in the hospital is Dick Erwin W6TXK. Get well soon OM.

Saw Don W6MMU the other day waving a QSL card that he had received from a 220mc contact with W6FZA in Portersville. The evening of Dec. 22 (or was it Dec. 19th) these two ops got together on CW and posted a good DX contact. 150 watts on the Porterville end and Don was running 100 watts. Nice going you guys. Hope this is only the beginning of lots more of this activity . . . Saw my first call plate with anything but a K6 or a W6 on it the other day while in San Fran. WA6ADN passed me on the Bay Highway just a tooling along . . . Also saw an unusual sight in St. Louis a while ago. Who but K6KZT was running around in his station wagon with brightest call plates that I have ever seen. Must have repainted them, or it was just a sight for sore eyes for this op . . .

W6HSW seen in his Hillman, as was W6ZBV in his VW . . . That takes care of the sport car kick for this issue . . . Silent key from Rosemead is Roy Plummer W6-CNA who passed away this last month . . . A QSL from Hillis K6DQA tells of the change of meeting place and night for the TRI-COUNTY RADIO CLUB. Also announcement that Cleo EL5A will be guest speaker the night of the 12th of March Be sure and tell him hello for me, Hillis . . .

Open letter to Herb W6VJA. Please don't chop me off the mailing list for QRM . . What does S.C.A.R.S. stand for?? Now that 'gavel stealing' has lost a lot of its original enthusiasm, a new contest has been announced. RADIO PRODUCTS SALES (plug) has donated a beautiful trophy to the cause of Transmitter hunting. This trophy can be obtained by challenging the holder (in this case San Gabriel Valley RC) to a XMTR hunt on a club basis. Points are awarded to the first and second mobiles to find the hidden transmitters on each of the three bands, 10, 6 and 2 meters. The club can be challenged as often as necessary by anyone but the just past losing club, and they can go again in one months time. It's a lot of fun and with a very nice carry-home prize to the winner. If there are any takers, or anyone wanting info, contact the Prexy of SGVRC, Ev Stringer W6SRE of San Gabriel. He is usually on 2 meters with CD every Monday night, and on the 246 net other times at 7 p.m. . . .

Know what CCIR stands for? If you don't, better read the last issue of this mag again. It could be the most important thing to Ham Radio in many a year. In strictly non-technical terms, prior to an international conference on radio spectrum allocations, there meets a committee to discuss the recommendations to be made to this conference. Delegations from all over the world will be meeting at the Biltmore Hotel starting April 1, 1959. The amateurs under the leadership of the SW Division Director will maintain and operate an amateur station at the hotel on a 24 hour basis. All affiliated ARRL clubs are asked

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# Sidelights on Sideband

**Lester A. Earnshaw, ZL1AAX**
**Box 51, Warkworth, New Zealand**

I have learned that when one pulls the bathplug here, in the Southern Hemisphere, the water, as it gushes down the plug hole, rotates in a direction opposite from that you get when you pull the plug over there in the States. But let me assure you that upper sideband transmitted from ZL does remain upper sideband when received in the States and techniques don't take a giddy anticlockwise or clock wise turn when exchanged between our two countries. (I won't vouch for what may happen when a helical antenna is used at one or both ends.) I am therefor hopeful that I may be able to bring you one or two new thoughts on SSB even though some may perhaps be old subjects warmed up so to speak. Quite often a dish prepared by a different cook will taste a new and better way. But of course, if we are to have a dish at all, we must have ingredients and this is where I appeal to you for help. The Editor has made all this space available to SSB and if we are to utilize it to the full then I am going to need the help of you all. Let me know what it is you want to read about and I will endeavour to write it up. If you have a new "gimmick" that you think the gang might like to read about please drop me a line and I'll do my best with it. I won't promise to drop everything and do a rush job but I will fit it in as and when I can. And lastly, I do promise to pick the brains of all my best friends -my enemies too- and with yours and my own experiences perhaps we may be able to cook up a meal of SSB that won't give you too much indigestion.

Perhaps you have wondered how the American ham bands sound to us down here. This is easy to tell. Around 0400 GMT on say 20 meters--awful. From 14.3 down to say 14250 the band might well be one of those large sponge cakes made of different colored layers sandwiched one upon the other. The top layer might well be composed of Ws and K9s. Assuming you eat like a small boy, from the top down, you quickly make short of the first layer and begin on the next. The next might be W8s, and so on down. The whole is a mess of noise+whistles, off-tune voices, screeches and screams. Tuning needs to be done with care, and sharp filters are a must. Though I may be conversing with a station who runs a 9 plus 20 signal the copy may be difficult because under are all the other layers, perhaps only a point or so down. Quite often there may be several stations using the same frequency. Though they may not be audible to each other they more than likely will be audible here. (The AM end of the band, I would mention, sounds like an orchestra of a million sparrows tuning up!) But in your late evenings and early mornings, conditions for ragchewing are excellent.

Around 0600 to 0800 GMT, 75 meter W stations often arrive over here at more than S8 and many the ZL, not conversant with the QRM position over there, calls you in vain. Many of us do make it and I think I can pin about 30 States now on 75 meter SSB. Note that ZLs transmit from 3.5 to 3.9 megs and VKs from 3.5 to 3.8megs. SSB in ZL is usually around 3.8 and in VK around 3.75 megs. VK1GU advises that he regularly listens for calls above 3.8 and he will transmit just below that. Best time is around 0900 to 1100 GMT.

40 meters is a mass of commercial QRM over here. Not from ZL but from countries which specialize in one stringed musical instruments, or so it sounds.

ABOUT 10 AND 15

ZLs would operate on these bands if there were more activity. Many though, when they go up there are so snowed under with requests for QSLs they prefer to stay on bands where there are more ZLs to share the burden.

If you would like to be happy

about starting a fight just mention the word splatter. Tell a fellow he splatters and you'll find yourself in more trouble than had you called him a communist. This I would say is a red hot subject. Let us discuss it. We might term it:

SPLATTER - Cause And Cure

Splatter may take place in the exciter. Perhaps this is not generally known yet it is fact that splatter may occur in any mixer or amplifier stage. Level has nothing to do with it. But because mixers are usually working well within their capabilities it is not often that they give trouble. However, it is well to realize that they may. Incorrect bias and screen voltages, incorrect injection voltages and and various other factors can cause these circuits to distort the signal and thus cause splatter. If the tube manual says .35 mils of injection current you should aim to get that current. Recently I worked on an exciter belonging to a friend. The 6BE6 mixer ran 3 mils of injection grid current. Now the signal not only sounds nicer but the sideband suppression and width have improved. In the low level amplifier stages the drive requirements of the following stages is usually high and even the exciter output tube may drive a tube that does not draw grid current and therefor has a high impedance. This means that the high impedance circuit offers what is virtually a non-existence load to the driver. If there is no load on the driver the plate current of the driver tubes is unable to rise. How might this cause splatter you may well ask. I will try and show you:

We apply a signal to the grid of an amplifier tube. The plate current rises and a greater current flows through the plate tank. Now we increase the signal and of course get a greater output due to higher plate current. We further increase the signal to the grid expecting a proportionate increase in plate current but now the load is such that the plate current is unable to rise. Thus do we flat-top the waveform, in other words we have created square waves and as square waves contain an infinite number of harmonics so do we find ourselves with a couple of sets of sidebands that are wider by far than they should be and so someone comes around and puts a hammer through the works. Remember that the final will pass on most everything that is presented to its grid circuit INCLUDING splatter. The cure? Well, you know it already-swamping.

Now we'll take a different case. Let's assume that the final operates Class B. 811s for example. Here we have a varying grid current. When you pause to light a cigarette there is no sound applied to the microphone and no grid current. The impedance is high. You suddenly decide to say a Hello to Bill over in the next town and the grid is suddenly smote with a mighty signal which is quickly rectified. Now we have a hefty sort of reading on the grid current meter, the impedance has dropped to a low figure and the old driver is suddenly flattened to the ground with excess luggage. The greater the CHANGE in grid current the more difficult it is for the driver to cope. By way of example, a horse may well carry a 700 lb load without difficulty but drop a 500 lb weight onto his back from say six feet up, lift it, drop it again and see what happens to the horse! All things being equal Class B is easier upon the driver than is AB2 because the TOTAL variation is less. The cure? once again, swamping. If we swamp the driver the percentage change in impedance will be less. Now of course we need generate lots more power in the exciter just so that we may have the pleasure of drowning it in the swamping resistor. This we must do if we are to retain linearity. The only alternative is to use a tube that operates Class A and accept the poorer efficiency. You can't have it all ways.

At this stage I must point out that if your particular amplifier is only a voltage amplifier (A 6BA6 for example) that supplies no power but voltage only, to the next stage and further, if the next stage does not draw grid current, then it is not normally necessary to provide swamping. If all this sounds confusing just hearken back to your audio pre-amp learning. What applies there applies here. Apart from the frequency of the amplified component there is little differ-

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# San Diego Zero Beat

E. H. Marriner, W6BLZ
528 Colima Street
La Jolla, California

Hi fellas! For once you have sent me more than I can put into the column this month, and I want to thank you, keep it up. The SDCORO had a very superb talk on Morocco with colored movies given by W6NYG ex-CN8IJ. If you are interested in some off the record stories to pep up your club meeting, plus information on native life and amateur radio in the Sahara Desert, drop Franklin a card, he will be glad to visit your club. You will never regret inviting him as its just like watching a TV travelog. He's good!

W6KBT resigned as SD's Red Cross Chapter Communications man after many years of public service. He will be missed believe me, Johnny put in a lot of hours each week at the Red Cross Bldg.

The Coronado Radio Club is issuing a certificate to any radio amateur contacting 100 SD county amateur stations. Who will be the first to get this new certificate? Another new award to shoot that has not been previously announced is: The "20-K" award issued upon proved receipt of contact with at least twenty overseas bases of the USA operating under the K prefix starting from Jan. 1, 1955 per ARRL Official Countries list for that date, or any additions which may be made in the future, subject to possible change in requirements. Must be one of each 20 of the 24 possible K prefixes. Photostat reproductions of QSL cards will be acceptable. K and KN stateside will not be accepted. CN2 will not be accepted for KT1 or OX for KG1 and only one KC4 card. Purpose of this award is to stimulate contacts with our overseas bases. Send your application or cards with $1.00 to Mr. L. L. McMaster K2QXG, P. O. Box 206, Brightwaters, L. I., New York who is doing all of the tally work. If you want further information send him a self addressed envelope. Who will be the first? Let us know so we can print your call.

If you are hearing stations in our amature bands that are not supposed to be there, obtain an ARRL form CD-36 (rec/9/55) from ARRL Hq, fill it out and return to ARRL Comm. Dept.

K6ZQR Art Stevens now Vice President Mike and Key Club, W6WDL is sec/treas. I hear W6JVA and W6LRV put up a 40 meter dipole for the club which has a DX-35 on the air given to the club by W6LRV.

W6KZD just received his general ticket and is one of their happiest members.

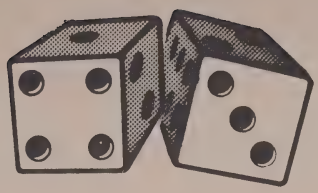
SD now has two SURPLUS STORES, look for their ads in WRA — both real fine bunch of people, drop in and talk to them.

I had dinner with W6YXU the other day after he lost the election, Bob felt so good he told me the best dinner story, "Give me the check". Received card from W7MXE sez we have a mighty fine little magazine. Thanks Fred, glad to hear from you. Incidently Don Wakeling, wot hoppin to you at the convention, I looked for you after the breakfast, whats your ORA? Will write. SD had an easterner, W3HIC in town for a few weeks and he made the rounds of many fellows he had QSO's on the air with. Impressed with our little magazine and carried copies back to the Philadelphia gang.

W6EWU tells me that W6LBZ is new on SB and he lives just in back of W7LBZ/6 and that he heard both of them talking to W6BLZ on SB, how about that? W6EWU had an interesting thing happen. He was in contact with WOTFQ whom he hadn't worked since before the war and was phone patched into Independence, Mo. to a relative. Tom used to live back there many years ago and was brought up to date on old friends in a hurry by WOTFQ, one of the good things about amateur radio.

K6GKX Ralph wants to get more 200 mc stations in SD to contact L. A. gang. Good contacts are being made from Mt. Potosi near Las Vegas and some of the San Jouquin Valley stations in Porterville. Some of the 220mc gang have been operating in Mexico giving the lads some DX on 220 mc. The net has grown from 15 stations in September to 40 as of this date. Ralph has a list of the active stations in So. Cal. and would be glad to send out copies. Write

Continued on page 43

# W  NEWS

**Howard S. Pyle "YB" - W7OE**
3434 74th Ave. S. E.
Mercer Island, Washington

There are three items of major interest which I should like to report this month. First, of course, is the sad duty of recording the passing of Harry Ubil, W7OHW, Historian for the Northwest Chapter of the QUARTER CENTURY WIRELESS ASSOCIATION. While this most unfortunate occurrence was not entirely unexpected as Harry had undergone a tremendous amount of major surgery for cancer in the past year, which apparently was of no avail, nevertheless not only the W7 s but the amateur fraternity at large will miss him greatly. He accomplished a most wonderful historical job for QCWA and the exceptionally detailed records of Pacific Northwest amateur radio which he had assembled will stand as a lasting memorial to him.

Now, a few words about about the "W7 MORSE CODE NET". Since a few of us inaugurated (or shall we say 'revived' as it was used almost exclusively prior to 1912 for 'wireless' communication) the use of Morse code in our radiotelegraph contacts, we've had much interested inquiry. This is NOT original W7 idea; the "OLD, OLD TIMER'S CLUB" (40 or more years as a ham) have had a Morse net functioning in the east for some time. They operate seven days a week on 7005kcs at 0800 EST on week days and 0900 EST on Sundays. Our Pacific NW net has gained a number of new members and some K/W6's have indicated a desire to partake. After discussion with some of our W7 members it appears that the consensus of opinion is that it will be better to keep such 'rag chew' nets local and not expand into wide areas. It is suggested therefore that other call areas interested in Morse code, arrange their own restricted area nets: ORM etc., are bad enough and adding a long-'forgotten' code makes it really rough! So, more power to you other areas but if you hear us on 3575 on Tuesday evenings at 1830, jump in, if you like . . . you're welcome!

And now, my third item is QUARTER CENTURY WIRELESS ASSOCIATION, Northwest Chapter. From all indications, this is the most active and progressive chapter of this old-timer's organization. The aggressive leadership of Chuck Emigh, W7ER as Chairman and "Doc" Spike, W7OS as Secretary, has been continued for another year by unanimous choice of the membership, which assures continued growth and progress. I'd like more of you W7 'old-timers' to give serious consideration to 'joining up'. If you can show proof of an active amateur station on the air 25 years prior to your application for membership, you NOW have an actively operating amateur station, three bux for initiation fee, two bux for dues (and ONLY two bux a year from then on) you're in! You'll meet, hob-nob and QSO with a mighty swell bunch of geezers and you'll have a pretty swell time at their semi-annual get-togethers twice a year, if you can get there.

Next dinner meeting (upwards of eighty generally attend including XYL's) is scheduled for Yakima, Wash., probably some time in June . . . any of you Yakima OT's who don't belong, better contact "Doc"W7OS, Chuck, W7ER or any member before then and get on the ol' bandwagon! The Chapter has a most impressive W7 historical record, thanks to 'Silent Key' Harry Ubil, W7OHW, maintains museums of old time ham gear in Spokane, Portland and Tacoma and operates both CW and phone rag-chew nets on Sunday afternoons. It's where YOU belong, OT! And . . . a Nationwide QCWA QSO party takes place every year . . . you'll LIKE it!

I'm going to have to also record another 'silent key' among QCWA members; Ernie McGhee, W7ZA, one of the earliest of the old time U. S. Army Signal Corps operators, passed away during the latter part of 1958. Ernie had a most impressive collection

Continued on page 35

# . . . WITH THE YOUNG LADIES

**JEAN Kincheloe K6OQD**
**6625 N. Brightview Dr.**
**Glendora, Calif.**

I just recuperated from the YL-OM Banquet sufficiently to get this column written. Believe me I was tired as I know the other gals who worked on the arrangements must have been. Congratulations to Midge K6BUS, for arranging a lovely evening for us all. Agnes, W6MFP, made ceramic hearts for all the YLs. I understand that the last of these hearts came out of the kiln on Saturday morning! There were 95 people at the banquet which was held on Valentine's Day at Raffles Restaurant. They all seemed to enjoy themselves and I know that this one sure did. Mr. Linden said a few words on the part of the FCC. You know, it wouldn't seem like the YL-OM Banquet without Pop Linden. The main speaker of the evening was Ray meyers, W6MLZ, Southwest Division Director of the ARRL. When our Prez. Elsa, W6JZA, said that she had asked Ray to speak for half an hour, I said to myself, "half an hour CAN be a long time." It turned out to be the shortest half hour I ever listened to. (The longest was when I took the code test down at the FCC, hi!) The thing of most timely interest that Ray touched on, is docket #12728 now on file with the FCC which would permit technicians the use of the 2 meter band. Now, I'm not going to get in to a hassle over that here. I will just say that when Ray asked for a show of hands from the YLs present, the vote was overwhelmingly against the proposal. The results were the same from the OMs. Ray also announced the appointment of Elsa, W6JZA, as assistant director of the Southwest Division to coordinate YL activities. Congratulations, Elsa; couldn't have made a wiser choice. Also present at the banquet were Evelyn, W9YWH, Treas. of YLRL and Mary, W9RUJ, publicity director of YLRL and also custodian of the Grandmothers Club award. It was real nice meeting the gals and hope they have enjoyed their visit to the west coast.

Two gals were sadly missed at the banquet. Ruby, W6WRT, who is at present in Glendale Sanatorium with a virus, Maxine, WA6AOE, who is down with a bad back. We missed you gals and hope by the time this is in print, you're both out kicking up your heels again.

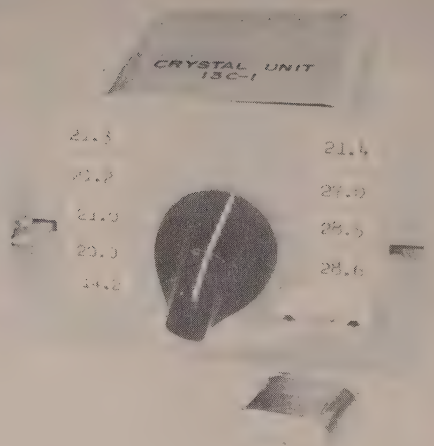
Several of us had a wonderful time on the 9th. We went ham shack hopping. We met at Elsa's, W6JZA, then went by and picked up Ruth, K6PRA. From there to Margaret's, K6VAP, where we had coffee and rolls. Then to Virginia's, K6MQS and back to Elsa's for lunch. After lunch we went to Mary's, K6OWQ for dessert and coffee and for a chance to see the RTTY in action while Mary talked to a gal in Alaska. All this was part of the entertainment of Mary, W9RUJ, who was staying with Elsa that week. Those in the caravan were Elsa, W6JZA; Mary, W9RUJ; Gladys, W6DXI; Ruth, K6KLN; Esther, K6LMV; Virginia, K6MQS; me K6OQD; Mary, K6OWQ; Pat, K6PFY; Harryette, W6QGX; Gene, W6QVK; and Margaret, K6VAP. I hope Mary enjoyed herself as much as we did but I bet she will be glad to get back home to Wisconsin where she can just sit, hi! Incidentally, Mary became a grandmother for the sixth time. Her granddaughter arrived on Feb. 8th. Mary thinks she is going to be named Mary after her grandmother. Congratulations Grandma.

I received a note from Louisa Sando, author of "CQ YL". She tells me the book has been brought up to date with two additional pages giving YLRL officers, new YLRL and YL club certificates available, recent YL recipients of WAZ and DXCC, plus the newest listings of WAS/YL, WAC/YL and YLCC awards. For those who already have the book

Continued on page 37

# MORE BANDS ON THE KWM-1

**Donald L. Stoner, W6TNS**
**P.O. Box 137**
**Ontario, California**




That mysterious "ding-fud" in the photograph will be immediately recognized by KWM-1 owners as the crystal box. This unit plugs into the upper left-hand corner of the KWM-1 and determines what frequencies the transceiver can be used on.

The Collins Co., trying to please everyone, has included crystals that cover the cw portions of the Amateur bands. Not being particularly interested in cw the crystals were swapped around and a few others added. As an example, when the Russians started propelling satellites around, a rock for 20 mc was added. This also serves for calibration with WWV. In addition, a suitable crystal for 11 meters (since deceased) was added. The new frequencies were typed on sticky mailing labels, cut to size, and pasted on in the proper positions. These labels can be peeled off, should the crystals be changed again, without marking the panel. After the photograph was taken, the 11 meter rock was given a suitable burial and replaced with one for the 10 meter DX band.

As more-and-more rocks were acquired for the transceiver, swapping them around got to be a chore and the modification shown came about. An external ceramic crystal socket was added in the most clockwise position of the bandswitch. Two ¼" holes were spaced ½" apart and centered over the panel markings. A third hole, for a small self tap screw was drilled between these holes. Finally, the socket lugs were soldered to the appropriate switch terminals. Now, when a different frequency is desired, the proper crystal is inserted in the socket and the switch placed in position 10.

At this point the reader may wonder how the author can afford all those expensive little crystals. The answer is, "I can't". The CR-18/U crystals "required" for the KWM-1 cost about $7.00 each, but I buy mine five for a dollar! It can be safely stated that ANY crystal from 4 mc on up will produce usable reception at some frequency in the KWM-1.

As an example, all those hermetically sealed rocks in the famous bin at J.J. Glass can be used in the KWM-1. If you doubt this, purchase a dollars worth, insert one into the crystal socket and peak up the exciter tune knob. Lo-and-behold, short wave reception. Of course, you genius types can calculate the frequencies, but I prefer "pot-luck".

Although the regular KWM-1 crystals are used in a doubler circuit, it appears that active lower frequency crystals will work up to four times their marked frequency.

The black FT-243 crystals are particularly useful. These crystals are marked as Navy Type CRV-40125 and were made by RCA for use in the MBF transceiver. There are five types in the "big bin" at J.J. Glass with fundamental frequencies between 15 mc and 19 mc. I use a 19.075 mc crystals (with wires stuck in the pins so it will fit the socket) to listen to the international 19 meter short wave band. Radio Moscow comes in very strong about 50 on the dial. You can also transmit with these crystals but, of course, this is not legal.

I have not mentioned this crystal thing to Al at J.J. Glass, for he would probably mark the price up. It will just be our little secret.

---

# Club Meetings

AMATEUR RADIO CARAVAN CLUB OF NEW MEXICO Albuquerque. All mobile club, meets ea. Wed. 7:30 p.m. MST on the air 29.6mcs, followed by activity at 8:00 p.m. 29.6mcs monitored; visiting hams urged to check in and participate.

ANTELOPE VALLEY ARC meets 3rd Thurs. ea. month Antelope Valley High School.

ASSOCIATED RADIO AMATEURS of Long Beach meet first Friday ea. month. Signal Hill City Hall. Hill and Cherry.

BAY CITIES AMATEUR RADIO CLUB: meets every Wed. eve. 7:30, room 55 Santa Monica High School, 6th and Pico Santa Monica.

CATHAY RADIO CLUB: meets 2nd Fri. each month Cathay American Legion Hall 8:30 p.m. 1524 Powel St., San Francisco.

CITRUS BELT AMATEUR RADIO CLUB meets every month 4th Fri. American Legion Club House, Colton, Calif.

COACHELLA VALLEY AMATEUR RADIO CLUB meets 3rd Wed. ea. month Public Works Bldg. Division & Center Sts., Indio, Calif.

CONVAIR ARC meets every other Thurs. 8: p.m. at club house on Harbor Dr. across from Ryan Aeronautical Co. Net 7250kc Wed. 2000 hrs.

CORONADO RADIO CLUB: meets 2nd & 4th Fri. at the Red Cross Bldg.

CRESCENTA VALLEY RADIO CLUB meets 2nd Tues. ea. month at La Canada Elementary school at 8 P.M.

DOUGLAS EL SEGUNDO RADIO CLUB meets 2nd Wed. ea. month Richard Henry Dana Junior H. S., 135th & Aviation Blvd., Hawthorne, Calif. 7:30.

DOWNEY AMATEUR RADIO CLUB meets 2nd & 4th Tues 8 P.M. at the new Imperial School. Imperial Highway between Downey Ave. and Paramount Blvd.

EAST BAY RADIO CLUB meets 8-p.m.-2nd Fri. each month at the Cornell School. Albany, Calif. Club call W6CUS.

EAST VALLEY RADIO SOCIETY meets 2nd & 4th Fri. 8:00 p.m., LaPuente City Hall Council Chambers.

EVERGREEN 50 & UP SOCIETY meets Fri. eves. 847 E., 94th St. Seattle, Wash. contact Bill McCafferty W7UZB for information.

FAR WEST RADIO CLUB meets 2nd & 4th Thurs. Veterans Memorial Bldg. Fortuna, Calif.

FRESNO AMATEUR RADIO CLUB meets 2nd Fri. each month at the Pacific Gas & Electric Co. Building Auditorium.

FULLERTON AMATEUR RADIO CLUB INC. W6ULI meets in American Legion Hall 2nd Wed. of each month.

GLENDALE AMATEUR RADIO CLUB meets 2nd Fri. ea. month at Civil Defense Control Center, 613 E. Broadway, Glendale, Calif.

GOLDEN EMPIRE AMATEUR RADIO SOCIETY INC. (GEARS) meets every 3rd Fri. at Region 3 Civil Defense Hdq., 7th & Cedar St., Chico, Calif.

HAYWARD RADIO CLUB meets second and fourth Fridays at Hayward Airport North end of field.

HELIX RADIO CLUB meets 1st Fri. ea. month at Gillespie Field CD Hdq., El Cajon, Calif.

HUGHES AMATEUR RADIO CLUB meets 1st & 3rd Sat. 2: p.m., 650 E. Manchester Ave., Inglewood, Calif.

INGLEWOOD AMATEUR RADIO CLUB meets 2nd and 4th Friday ea. month at 105 Grevillea, Inglewood.

LEWIS COUNTY AMATEUR RADIO CLUB, (ARRL Affil.) meets 1st and 3rd Monday in County Court House, Chehalis, Washington on US 99, 8 pm. You are welcome W7NTO.

LAGUNA BEACH AMATEUR RADIO CLUB meets 4th Friday ea. month at City Hall, Laguna Beach.

LAKE WASHINGTON AMATEUR RADIO CLUB W7BB Bellevue, Wash., meets 1st & 3rd Wed. ea month. For details contact Al Wolfe, W7SOY. Phone SHerwood 6-1116.

LA MIRADA AMATEUR RADIO CLUB meets 1st Mon. ea. month Rancho School, Demanda & San Cristobal 7:30 p.m.

LITTON RADIO CLUB K6WYB meets 1st Thurs. ea. month. Litton Industries, 336 N. Foothill Rd., Beverly Hills, Calif.

LIVERMORE AMATEUR RADIO KLUB: meets 1st Fri. ea. month 7:30 p.m. Recreation Center, Livermore Calif. Code and theory classes on Fridays.

MARIN AMATEUR RADIO CLUB meets 8: p.m. 2nd Fri. ea. month Red Cross Chapter House, 712 N. 5th St., San Rafael.

MIKE AND KEY CLUB meets 1st & 3rd Tues. ea. month at the Encanto Community Center 65th & Broadway, San Diego, Calif.

MOBILE RADIO CLUB OF SOUTH GATE: meets 1st & 4th Thurs. ea. month at 10131 Mallison Ave. South Gate 7:00 p.m

MOJAVE DESERT AMATEUR RADIO CLUB meets 2nd and 4th Sundays at 2:00 P.M. Northrop Recreation Bldg., Palmdale.

MT. DIABLO RADIO CLUB meets third Friday, 8 p.m. Contra Costa J. C. in Concord.

MOUNTAIN VIEW AMATEUR RADIO CLUB meets 1st Thurs ea. month at the new Central School Cafetorium, 14741 E. Central Ave., Baldwin Park, 7:30 P.M.

NEWPORT AMATEUR RADIO SOCIETY meets 2nd & 4th Fri. ea. month at Parks & Recreation Hdqts. Bldg., 1714 W. Balboa, Newport Beach, Calif.

NORTH BAY AMATEUR RADIO ASSN. meets 1st Fri. 8 p.m. Red Cross Bldg. 508 Alabama St., Vallejo, Calif.

NORTH SEATTLE AMATEUR RADIO CLUB meets 2nd Thurs. ea. month at 96th & Roosevelt, 8: p.m., Seattle, Washington

NORWALK RADIO CLUB meets 2nd and 4th Wed. at Los Alisos School Auditorium, Maidstone and Excelsior Drive.

OAKLAND RADIO CLUB meets 1st Fri. ea. month 8 p.m., 906 Fallon St., Oakland, Calif.

ORANGE COUNTY RADIO CLUB meets 3rd Wed. ea. month at 12502 Placentia, Santa Ana.

PACIFICO RADIO CLUB K6BAG meets every 2nd Sunday ea. month 9048 W. 18th St., Los Angeles. Contact W6NJU.

PALISADES AMATEUR RADIO CLUB meets 2nd and 4th Tues. ea. month at Rustic Canyon Club House, 601 Latimer Rd., Santa Monica Canyon.

PALO ALTO AMATEUR RADIO ASSOCIATION meets 1st Fri. ea. month at Menlo Park City Hall, Menlo Park, Calif. 8 p.m.

PASADENA RADIO CLUB meets 2nd & 4th Fri. ea. month 8:00 p.m. basement of Altadena Sheriff station 780 E. Altadena Dr., Altadena, Calif.

PORTLAND AMATEUR RADIO CLUB meets 2nd & 4th Fri. 8 p.m. Portland Civil Defense Training Center 3031 S. E. 101st Ave., Portland Ore.

RADIO AMATEUR MOBILE SOCIETY (RAMS) meets 2nd Fri. ea. month Marconi Grade School, Sacramento, Calif.

RIO HONDO RADIO CLUB meets 1st Sat. of the month at Palm Park, Whittier.

RIVERSIDE COUNTY AMATEUR RADIO ASSN., INC. meets 2nd Fri. ea. month 8 P.M. Arlanza School, Riverside (near Rohr Aircraft plant)

RAMONA RADIO CLUB meets 2nd Mon. ea. month, Fire House, 605 S. Del Mar, San Gabriel.

RYAN AMATEUR RADIO CLUB meets 1st and 3rd Wed. 7:30 in Balboa Park.

SACRAMENTO AEROJET RADIO CLUB meets 2nd Mon. ea. month at Aerojet Nimbus plant site. Club call W6IJK

SAN BERNARDINO MICROWAVE SOCIETY meets 1st Thurs. ea. month Civil Defense Rm. 2nd floor City Hall 8th & Main Sts., Corona, Calif.

SAN DIEGO AMATEUR RADIO CLUB meets 1st Mon. ea. month American Red Cross Bldg., 3650 5th Ave., San Diego.

SAN DIEGO DX CLUB meets 3rd Tues. each month at various homes. Call W6BZE or W6LRU AC 2-2933 for info.

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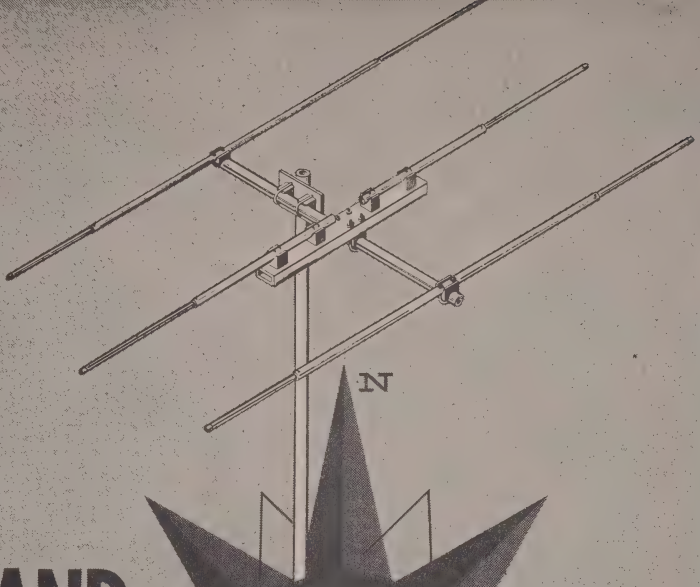
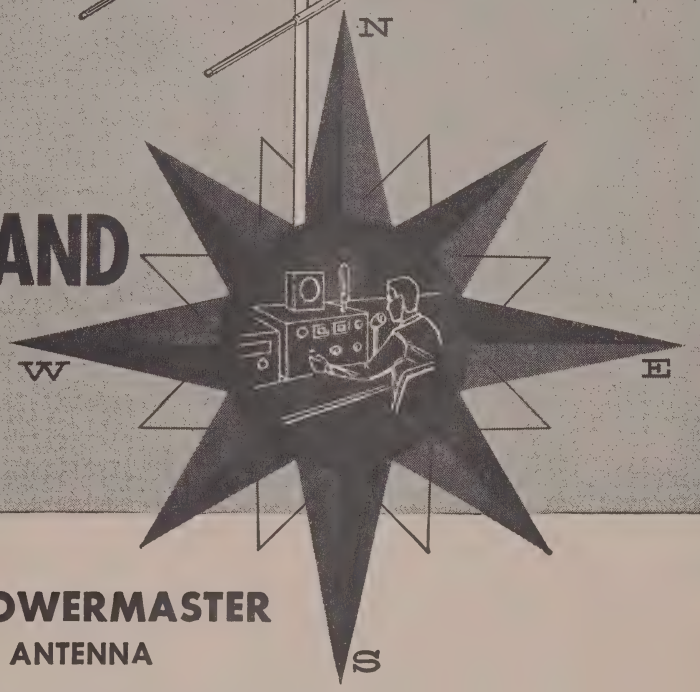


# COMMAND YOUR BAND

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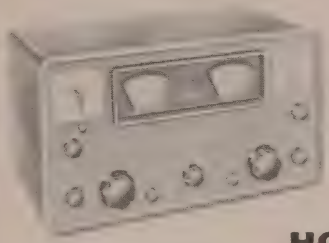
Telephone RY 1-6683

# March & April Hammarlund Promotion



$249.00

## HQ-110

A true amateur receiver at a low price! Dual conversion. 6, 10, 15, 20, 40, 80 and 160 meter ham bands. Crystal calibrator. Q-multiplier. Separate linear detector for SSB and CW. Separate BFO.

Optional Telechron clock-timer $10

Free with every purchase of a Hammarlund Receiver; Your choice of one of the following:

1. $10.00 towards the purchase of your choice of any Hy-Gain antenna.
2. Hammarlund Speaker
3. 24 Hour Clock

$269.00

## HQ-145

Brand-new general-coverage receiver! 540 KCS to 30.0 MCS. Dual conversion. Adjustable 60 db slot filter. Crystal filter. 11-tube superheterodyne with automatic noise limiter.

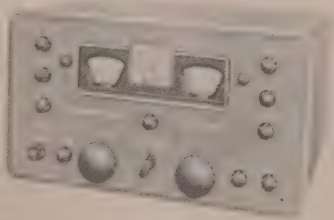
Optional Telechron clock-timer $10
Optional plug-in 100 KCS calibrator $15.95

$189.00

## HQ-100

True Hammarlund quality at low cost! General coverage, 540 KCS to 30.0 MCS. 10-tube superheterodyne with automatic noise limiter. Electrical bandspread. Q-multiplier.

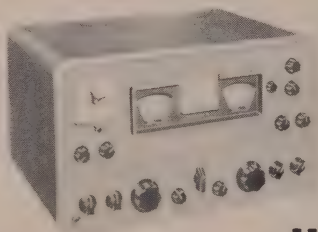
Optional Telechron clock-timer $10



$379.00

## HQ-160

Everything you could wish for in general-coverage! 13-tube superheterodyne with automatic noise limiter. Dual conversion. 540 KCS to 31.0 MCS. Crystal calibrator. Electrical bandspread. Slot filter. Q-multiplier.



$359.00

## HQ-170

Best for the amateur at any price! Dual and triple conversion 17-tube superheterodyne with automatic noise limiter. 60 db slot filter. Separate vernier tuning. Selectable sideband. Tuned IF amplifier. Crystal calibrator.

Optional Telechron clock-timer $10

Continued from page 17

miles northeast of Reno, Nevada.

This spottiness in reception area has gotten some fellow hams highly perplexed, as they, when not hearing the station being worked, start to tear down their converters, etc. It took a good deal of explaining on the writers part to get across the point that if you are not in the proper location you are not going to benefit from knife edge, regardless of how your converter may be.

We plan to conduct tests in the near future on 220 and 432 megacycles to determine if there is a frequency cut off on the paths involved, and to compare signal strengths for the 3 bands.

Power at the three transmitters is only moderate. K6ERG in Carmichael is running 250 watts to a 4 element yagi approximately 65 feet above ground, although in the past he has been able to work both ends of the path with a Gonset Communcator (6 watts output). W7MAH, Reno, Nevada is on SSB with 800 watts and a nine element yagi 65 feet above ground. K6RNQ is running 700 watts CW at present to a five element yagi 65 feet above ground. The fact that all stations concerned have their antennas at the common height of 65 feet above ground is pure coincidence, and in Oakland, tests run with the antenna varying from 15 to 65 feet show just a 6db signal change with K6ERG at Carmichael. What effect the varying antenna height would have on the Oakland-Reno path is open to conjecture, never having been tested.

This was written with the intention of encouraging those who live in impossible locations to put a little more effort into working out on six meters (and higher frequencies also). After all, no path could look more impossible at first (or even second) glance than Oakland-Reno!

---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TONS OF SURPLUS ELECTRONICS. LARGEST DEALER IN THE HARBOR AREA

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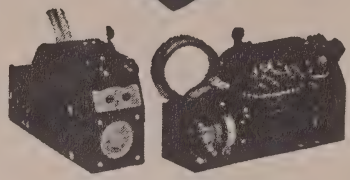
Open every day 10 to 6 Closed Thurs.

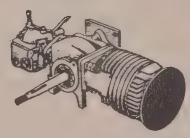
**RADIO ELECTRONIC SURPLUS LOOK**



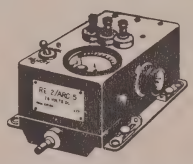
**APG 15 INDICATOR**

Easily converted to a MODULATION INDICATOR. Unit contains a 2AP1 tube with shield; also 9006 tube, miscellaneous potentiometers and resistors. Brand new.....$5.00 each

**NEW 1¼ H.P. GASOLINE ENGINE**



Made by Jacobsen! 1¼ h.p., 3600 rpm, 2-cycle, ball-bearing crankshaft, 2" bore, 1½" stroke. Complete with carburetor. With addition of flywheel and ignition system (not included), makes an ideal engine for generators, pumps, lawn mowers, midget cars, etc. Price $10.00

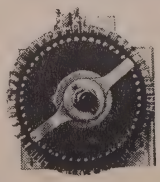


**ARC-5 ANTENNA RELAY**

Consists of 2" meter 0-10 RF thermocouple and 12 VDC relay (transmitter-receiver). Meter .75 amp RF with thermocouple produces 5.4 ma D.C. full scale.
Price.....$1.95 ea.

**NT-6 WILLARD 6-VOLT STORAGE BATTERY**

Rated 2.4 amp. hr. Approx. dimensions: 3½" l. x 1¾" w. x 2⅛" h. Weight: 1 lb. 3 oz. (plastic case) Dry charged..Price $2.50 each



**44 POSITION STEPPING SWITCH**

With automatic reset. 24 volt A.C. Dimensions 4¼" x 4¼" x 3" deep. Mfgd. by Wico .....$3.00 each
Five for $12.50 postpaid

**BC733D GLIDE PATH RECEIVER**
108.3-110.3 mc. Used; good condition.....$7.95

NO C.O.D's. REMIT FULL AMOUNT WITH ORDER. ALL PRICES F.O.B. PASADENA.

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2176 E. Colorado St. • Pasadena 8, Calif.

# WE MADE OUR MOVE!

# NOW IT'S YOUR TURN!

**Yes, we have moved to our new location and are celebrating with 4000 sq. ft. of the finest surplus values — Catch us while we are still excited and you'll see values like these:**

**Misc. Specials**

5R4GY Tube, boxed .... 69c
25x25mfd 450 plug in tubular condensers ..... ea 39c
Silver plated variables, 2.8 to 17.5mmf, with disc padder built on. Shaft goes thru so they can be ganged. new boxed 36c ea. or 3 for $1.00

**Eight Wire Cable**

Eight wire shielded cable. 14,000 ft., and yes it's new also. Has one #16 & seven #18. Any length 7½c per foot. 500 ft drum ..... $35.00

**TBS Xmtr & Rcvr.**

TBS, 60 to 80mcs. Pay attention now! BOTH the trans. & Rcvr. complete for only ..... $14.95

**Vibrator Supply**

Radiart CRF Vibrator Supply. 12 volts input. Output is 500 volts at 70ma (conservative) 90 volts at 10ma, and 1.4 volts at 250ma. Made for TBX-7 or 8. Brand new. Yours for only ..... $9.95

**Scope**

ID-80A/APA-17 Scope. With all tubes. 400cy supply. Convert or use the parts. Like new condition, only ..... $8.95

**Phone Patch Units**

These are not used and corroded, but brand new in sealed cartons.
RM-52, $1.25 two for $2.00
RM-53 $2.25 two for $4.00
or a RM-52 & a RM-53 for $3.00
(See Oct. CQ & July WRA)

**Collins ART-13**

ART-13 Collins Auto-Tune 100 watt table top Transmitter. Ex. con. ..... $49.50

**RT-7/APN-1 Altimeter**

Transceiver. All 14 tubes, 27 volt dynamotor and the famous wobulator unit. Great for 432 and like new for only ..... $9.95

**Transponder**

AN/APX-6 Transponder. Three UHF Cavities with 2C-42, 2C46, 1B40 Lighthouse bottles. Plus a 3E29 and 29 other tubes. Many parts for just ..... $17.49

**Meters**

Triplett #221-T, 0-5 amp DC, 2½" rd. new onl .... $3.95
G.E. 0-1ma (scale reads 0-4-KV) 3½" rd. new .... $2.95
0-50vdc 3½" rd. new $3.95

**Modulators**

MD-7 Modulators for ARC-5. With tubes, and very clean. Only ..... $4.95

**AN/ARC-1**

AN/ARC-1 Rcvr.-Xmtr. 10 channel crystal controlled. 100 to 156mc., am. Very nice ..... $54.95

**Scope**

RDJ Pulse Analyzing Scope. Uses 5CP1, plus 15 tubes.. Panel meter reads pulses per second up to 300. Elliptical sweep 25 to 10,000 cps. 115 volt 60 cy supply. Terrific value ..... $19.95

**RG-8/U Coax**

20,000 ft,, and brand spanking new ! ! May we cut you off a piece ? ? Any length for 6c per foot.

MANY other values . . . Come in and browse . . . We have transmitting tubes, and those hard to find small parts.

MAIL ORDERS GIVEN SPECIAL ATTENTION!
Please include postage. Any excess will be refunded . . . Calif. residents add 4% tax so our state won't go broke . . .

# ALL-TRONICS OF SAN DIEGO

**3024 EL CAJON BLVD., SAN DIEGO, CALIF.**

K6KFY K6GAS K6VOB K6SGV

## A 3 TUBE TRANSMITTER

Continued from page 8

SHORT LEADS between parts. Otherwise you might as well STOP right here.

When the first article was published, we received many letters about the rig. Some were complimentary, some were asking for information and some were downright nasty! No one questioned my ancestry, but several questioned my intelligence. That was all to the good however . . . I do this at times myself. I sent two completed rigs back to Falls Church, Virginia, to prove that they were as written up, and workable. They are, and I still can prove it. We have one on hand at all times for just such experiences, and welcome having you drop in and discuss it with us at any time!

---

# Patronize Our Advertisers

We've had the above picture kicking around the office here for some time now, just never seem to get the room to stick it in. Promised Irv Finkel I'd get it in this issue for sure.

Seriously though, you should take a run out the new Ventura freeway and visit IFA Electronics. 8,000 sq. feet of modern store, jammed full of real terrific buys in Hi-Fi equipment, electronics of every description, not to mention a lot of real clean, new surplus at give-away prices. While you are out there ask for Irving Finkel. He is the owner, and is no newcomer to the electronics business, having been former sales manager for Harvey Radio, Industrial sales manager, Newark Electronics in New York and Industrial sales manager for Federated Purchaser, so he can help you out with your problems. Tell him we sent you out.

---

GET ORGANIZED, BUY AT
ALLIED ELECTRONIC SUPPLY CO.

SPECIAL! Invest in the future. We have in stock the long sought after BC-453 Receiver tuning 200kc to 500kc with 85kc I.F.s. Stock up now or you will be sorry. There are many articles coming out using these receivers as a filter SSB transmitter or transceiver for 80 and 40 meters. A crystal controlled converter built on the back makes it an unsurpassed mobile SSB receiver because of the 85kc IF's. OUR PHENOMINAL LOW PRICE $8.50 * Lowest anywhere in the USA at this time. If you don't believe us, just check the ads for yourself.

OTHER SPECIALS: Small Coax relay with BNC fittings $2.95. Allied Antenna Switching Relay, 3 pole double throw, 12 volts for mobile or home use, only $1.25.

ALLIED ELECTRONIC SUPPLY

*San Diego's Largest Electronic Surplus Supply*

**4081 University Ave. San Diego 5, Calif.**
**Phone: At 2-0668 Mr. P. R. Bryant**

**SANGAMO & CD TYPE H MICAS**
**YOUR CHOICE 10c EACH**

.01 2500v test, 1200v working
.001 2500v test, 1200v working
.02 1200v test, 600v working
.01 1200v test. 600v working
Faradon UC2309 mica .004 3000vac, 6000vdc ea .25
W. E. D162034 .03x.03 1500vdc ea .25

**OIL CONDENSERS**

4mfd 600v oil 4"x2½"x1⅛" w/brackets.. ea .50
10mfd 600v oil 2.5, 2.5, 5mfd w/brackets .... ea .60
.01 5000v oil Aerovox type 12 ea .65
.5 1000v Pyranol 23F159. & Aerovox JP 1016MCT ea .25
.1-.1 4500v G.E. Pyranol No. 25F786 ea .25
1mfd 3000vdc Aerovox ea .98
.007mfd 5000vdc type F3L ea 1.25
5mfd 660vac, 1500vdc ea .98
10mfd 1,000vdc oil ea .98
Imfd 600vdc G.E. Pyranol w/brackets ea .20

**MISCELLANEOUS**

Butterfly Variables 70uufd & 35uufd ea .25
Sprague motor capacitor 400-450mfd 110vac 60cy No. NT483950 ea 1.00
Motor capacitor 130-157mfd 110v 60cy K5826959-AA3 ea .50
20 to 100 watt resistors, your choice ea .25
½ to 2 watt resistors, most IRC ea .03
Wire wound pots. 4 watt 2500 ohm to 75,000 ohm ea .35
3000 ohm 2 watt wire wound pots ea .20

VARIABLE CONDENSERS

20-125 mmf Ceramicon trimmer. same as type 823CRL .25

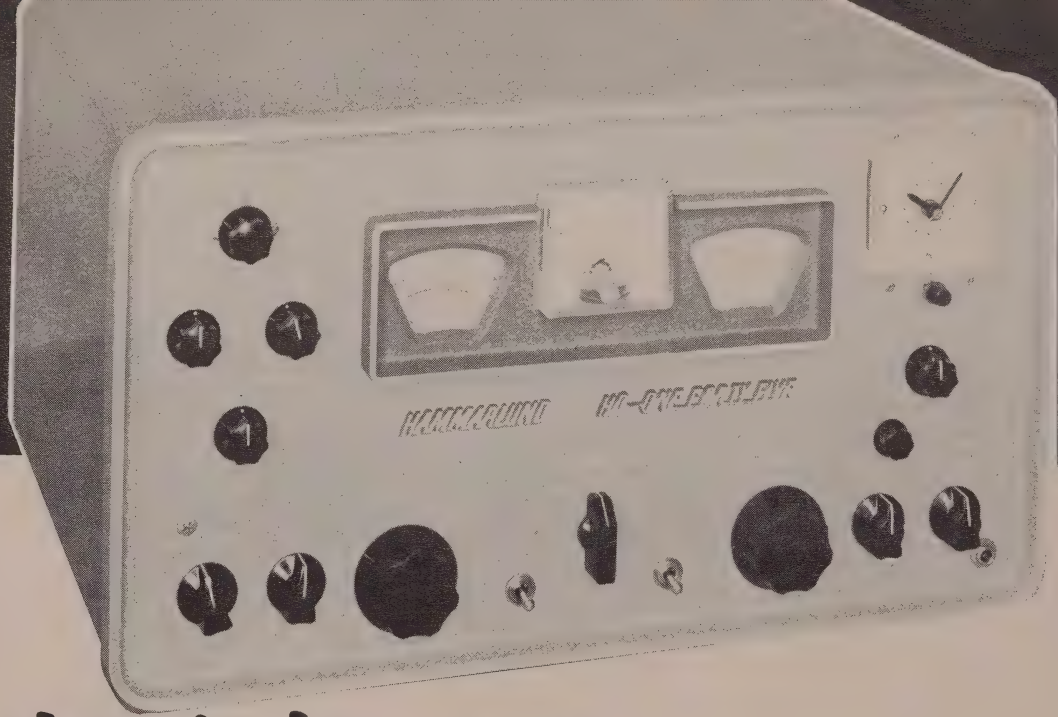
Manufacturers and jobbers attention: Wire wound resistors from 6 watt to 25 watt. Many different values. Write for price and quantity. Large stock Eirie Ceramicons, and other condensers not listed above. Write or phone your requirements.

180,000 WIRE WOUND RESISTORS IN STOCK

**VERNS**

**7701 S. Normandie Los Angeles 44, Calif.**
**PLeasant 1-0278**

- General coverage—540 KCS to 30.0 MCS in four bands. Electrical bandspread on all ham bands within frequency range of receiver.
- Dual conversion from 10.0 to 30.0 MCS.
- Unique combination of adjustable 60 db slot filter and six-position selective crystal filter for endless tuning techniques.
- 11-tube superheterodyne with improved, automatic noise limiter.
- 0.5 microvolt sensitivity on CW with 10:1 signal-to-noise ratio.
- Hammarlund quality design and construction throughout.
- Optional plug-in type 100 KCS crystal calibrator.




# take a good look!

THIS IS THE **NEW HQ-145** $269.00 amateur net

Telechron Clock-timer, optional, $10 extra

Plug-in 100 KCS crystal calibrator, $15.95 extra.

| | |
|---|---|
| **Henry** | GR. 7-6701 |
| 11240 W. Olympic Blvd. Los Angeles 64, Calif. | **Radio** |

Take a good long look at the features offered in this newest Hammarlund receiver. Never before has so much been offered in a general-coverage receiver at such a low price. The all-new HQ-145 is another winner in the ever-growing line of quality Hammarlund receivers—whatever your needs and budget, you'll find your best buy is a Hammarlund!

## W7 NEWS

Continued from page 25

of old time ham gear, most of which he kept in his radio/TV shop in Hoquiam, Wash., and which included, among other things, a complete Murdock 1KW rotary spark station. Unfortunately, at the time of this writing, no will had been found and, aside from some distant relatives in the East, no survivors have been located. QCWA, as is their policy, is endeavoring to assist in winding up his affairs- a grand guy!

While on the general subject of QCWA, I would like to ask that any W7's who have evidence of FIFTY or more years as a ham, contact me. We now have of record, W7KX, W7ER, W7AMF, VE7JF and myself, and hope to form an 'auxiliary' to the Quarter Century group to include these 'half-centuries' (Golden Buzzards?)!

Me? Have I ever let a month go by without sticking "me" in the column? Since I retired November 30th, like all retirees, I've been sitting in a 'rocking chair'! Oh yeh? Teaching adult education classes (ham radio of course!) evenings at the local high school, writing books and magazine articles, painting signs and show-cards, couldn't keep me busy enough . . . so, believe it or not, buying, repairing and selling antique clocks and fixing modern ones as well! Actually! Thirteen last week! Who says you retire to 'life of ease'? I'm getting a BIG kick out of all of it : : : doing what I want to do and accountable to nobody . . oh well, there IS the XYL!

Now that we've lost our Editor, Art, to broader fields (?) maybe all this copy will sneak by the publisher this time! Publishers never have any problems . . . just print what they get and collect the dough from the advertisers and subscribers and live a life of ease! I can just see Don grit his teeth, cuss me out and say, "Oh . . . how FERVENTLY I wish that that were true!"

73

---


6 VOLT DYNAMOTORS

425 volts output ..... $7.95

600 volt Disc Ceramic Capacitors fixed values ..... 5c ea.

HUNDREDS OF SURPLUS PARTS FOR GADGETEERS, COMMERCIAL, MARINE

**THOMPSON ELECTRONICS**

6841 Stanton Ave. Buena Park, Calif.

BOOKS

New Air Force Instruction Books: Basic Circuits, Advanced Circuits, Instructor Manuals, Antenna Systems, etc. ..... $1.00 - $4.00

G-3 .0012 20KV Mica Cond. ..... 16.60

G-2 .00065 20KV Mica Cond. ..... 5.50

2000mfd 15 vdc Cond. ..... 50c ea. 3 for 1.00

ARD Rcvr. Tunes 400-450mc. used ..... 14.50

Millen Scope Shields for 5BP1, 5CP1, new, ea. 3.50

115v 60cy Blower, 140CFM ,new ..... 13.95

Binding Posts, 3 way 10c ea. ..... 15 for 1.00

Megometer, 0-1000 megohm 500vdc portable 115.00

Sectional plywood antenna mast. Light wt. just under 10 lbs per section (8' 10" length) 5½" diameter ..... ea. 3.50

Power Supply, 115v 60cy. 24vdc 6a out ..... 9.50

Pilot Light with S-6, 115v lamp ..... .55

Powerstat, 0-135vac, 7.5 amp, new ..... 15.00

Choke, 4 hy 300ma potted, new ..... 2.50

Swinging Choke, 12-4hy, 300ma match above .... 3.50

Rack Cabinet, standard 19" 6 ft. ..... 32.50

Plate xfmr. 2400 or 4800 single ended. 750ma 120v in. Wt. 100 lbs. each $20.00, ..... pr. $35.00

Plate xfmr. 1460-0-1460v 500ma, 115v in, 7¾ x 7 3/16 x 6 5/8, Kenyon ..... 22.50

Filament xfmr. 6.3v 10a, 125-230v in, new .... 1.75

MANUALS

BC-191 Transmitter ..... .75

172-J Signal Generator ..... .50

TS-297 VO Meter ..... .20

SCR 300 Transceiver ..... 1.50

LM Freq. Meter, all models ..... 1.50

SCR-625 Mine Detector ..... 1.00

AN/GRC-9 ..... 2.50

BD-72 ..... 1.00

AN/GRC3 TO8 ..... 2.50

EE-8 ..... 1.00

PM-29 ..... .50

BE-77 ..... 1.00

PE-75 ..... 1.00

SCR-399 ..... 7.50

TUBES

1625 ..... .30

12C8 ..... .30

12A6 ..... .30

12SK7 ..... .75

6L6 metal ..... 1.00

125Q7 ..... .75

12SR7 ..... .40

12K8 ..... .40

717A ..... .30

RF Coil part #41528 1.9 - 3.6mc grid ..... 2 for 2.50

Microphone Transformer, new ..... ea. .24

DM-35 Dyn. 12vdc in, 625v 225ma out w/xtra brushes ..... 9.50

DY-44U Dyn. 12vdc, or 24vdc to 12vdc 100 watts. In watertight metal box, w/switch & cables New ..... ea. $7.95

Wave Trap, 80 to 300mc w/calibrated dial, coax connectors ..... 1.50

Voltage Control 100-130vac from 115v input. 18 amp Transtat ..... 14.50

SPECIAL Transmitting Cond. 80mmfd variable 25c each ..... 5 for 1.00

**Hours 8:30 to 5:30 Sat. 8:30 to 3:00**
**or phone and we'll wait**

SATISFACTION GUARANTEED
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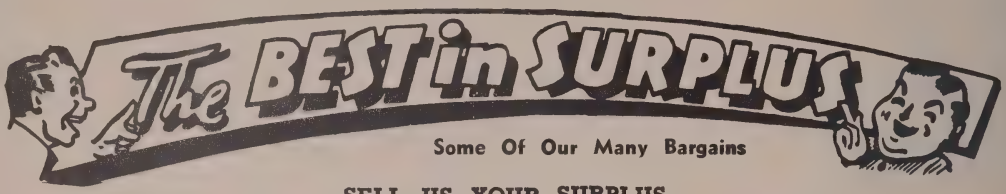
**DUnkirk 2-8383**

# ATTENTION HAMS




**Some Of Our Many Bargains**

## SELL US YOUR SURPLUS

Meter, G. E. 3" 0 center, 15ma ..... 3.50
Meter G., 3" O-150ma ..... 3,50
Running Time Meter 110v 60cy Westinghouse 9.95
Precision Multitester No. 856 ..... 39.50
G. E. Meter case 3" sq. ..... .50
Transformer, 900vct. 225ma ..... 3.95
Filament Xfmr. 6.3v 10 amp ..... 1.95
Xfmr. LP-0120, 110v pri. 60cy Sec. tapped from 3 volts to 24 volts at 2 amp has ct/tap ..... 1.95
Selenium Rectifier, 24 v 3 amp full wave ..... 4.95
Selenium Rectifier, 115v 3 amp ..... 10.00
Filament Xfmr. 5 v 18a, 6.3v 15a ..... 4.95
Plate & Fil. Xfmr. 95-260v pri, 425vdc, 250ma, 300v, 125v, 5v, and 6.3v ..... 4.95
Scope Transformer, 3890 volts. w/filament ..... 1.00
Hi Fi Power Supply kit, complete ..... 10.00
Xfmr. Pri. 115v 60cy. Sec 1 330vct at 85ma Sec 2 5v at 2amp, Sec. 3 6.3v at 7½ amps ..... 1.50

Sola Constant Voltage Transformers
100 watt ..... 17.95 250 watt ..... 24.95

Isolation Transformers
100VA ..... 4.50 1600 watts ..... 24.95

Power Transformer & choke for pp 807 tubes 4.95
115v 60cy 110ma Plate Transformer ..... 1.95
872A Fil. Xfmr. insul for 25 kv. ..... 7.95
5 KW Plate Transformer, new ..... 49.95
Filament Transformer 12 volt at 3 amp ..... 1.00
Hi Fi push pull 6v6 output Xfmr. ..... 1.50
12.8hy 200ma Filter Choke ..... 1.50
10.5hy 150ma Filter Choke ..... 1.00
4.25hy 445ma 39 ohm filter choke ..... 1.50
15mc IF Transformer ..... .50
Variac, 2 to 3 amp ..... 12.50
Choke, 8hy 100ma ..... . 75
4mfd 3000v oil condensers ..... 4.95
4mfd 600v oil Condenser ..... . 95
15mfd 1.000v Oil Condenser ..... 2.50
5mfd 10,000 volt oil, Westinghouse ..... 50.00
4x8mfd 600vdc Oil cond. w/brackets ..... 1.75
.25mfd 6000vdc Oil Condensers ..... .50
9mfd 1000vdc Oil Condensers ..... 1.00
.5 10,000 vdc Oil Condensers ..... 5.00
FP Condensers, 1000 & 500mfd x 15v ..... .15
8mfd 1000vdc Sprague Oil ..... 1.50
Large selection G type Micas .....
HI-Q, Ceramic, & Silver Mica condensers. Most sizes only 10c ea. Wire Wound Resistors, most sizes in stock from 10c to 50c
4mfd x 2000v Cond. ..... 2.49
Relay, 115vac double pole ..... .95
Relays, 6, 12, or 24 volt, small ..... ea .95
Relays, 3PDT and 4 PDT 24 volt ..... ea 1.00
Relays, 115vac & dc ..... 1.00
Ratchet Relays 12vdc, real bargain ..... .50
BK Relays 12vdc, full of parts ..... 1.95
K108 Relay DPST 6 or 12vdc 200 ohm ..... .95
3 circuit 10 pos. stepper relays 24v ..... 4.95
Dynamotor, 12v DM-34 Rcvr. ..... 4.95
Dynamotor, 12v Dm-35 Xmtr ..... 10.00
DM-42 Dynamotor ..... 6.95
PE-73 Dynamotors, used 24v ..... 4.00
12v PE-77 Dyn ..... 14.95
Motors, small, 115vac ..... 2.49
Blowers, large 110 volts ac ..... 19.95
LR Squirrel Cage Blower & Trans. for 115v 60cy. Bargain ..... 4.90
Selsyns, 115v 60cy ..... 3.95
Fan Blades 2 sizes ..... ea. .15

Interphone Amplifier, w/12 v dyn ..... 4.95
Chassis w/standard 19" x 8 3/4" panel. 18 sockets, full of parts. Panel has only 3 holes, real clean ..... .96
Vibrators, ATR heavy duty 6 volt ..... 1.49
BC-375 Tuning Units, clean ..... 1.00
2" Scope Kit ..... 3.95
10meter mobile Trans. w/ant., mike, tubes, and dynamotor. 6vdc, all new ..... 34.95
Hi-Fi 25 watt Amplifier Kit ..... 25.00
TG-10 Keyers ..... 14.95
Surprise package full of goodies ..... 1.50
Radiosonde Modulators, full of parts 2 for ..... 1.00
BC-683 w/spares ..... 19.95
RA-20 Rcvr. AC Supply ..... 8.95
BC-221 Frequency Meter Cases ..... 4.95
600 ohm Headphones, clean pr ..... 1.95
R-14 Headphones, 8000ohm imp ..... 2.95
TH-37 Headphones ..... 1.95
Trim Commercial hi imp Headphones ..... 3.95
TS-13 Handsets ..... 2.95
Single headphone cord w/plug ..... .25
Steel headbands HB-6 ..... .10
PL-55 Plugs ..... .40
PL-68 Plugs ..... .60
T 30 Throat Mikes, used ..... .10
Curly Cord for mike ..... .65
T-17 Mike Switch ..... .25
5BP1 Tubes ..... 2.95
3BP1 Tubes ..... 1.95
5CP1 Tubes ..... 1.95
6L6GA, new boxed ..... 1.00
6SN7GT new boxed ..... .75
2J61 Tubes ..... 1.50
12A6 Tubes ..... 3 for 1.00
3C37 Tubes ..... 2.00
Full line of tubes in stock
832-A Sockets ..... .95
803 Sockets ..... .95
1625 Sockets ..... 2/25
5CP1 Sockets ..... .15
J-44 Keys, and J-38 new ..... 1.50
Toggle Switch 4 PDT bat handle ..... . 75
Rotary Switches, many types ..... .25
Micro Switches SPDT ..... .25
Toggle Switch DPST bat handle, ea. 25c 100 $19.00
8 gang 6 step ceramic wafer swich ..... .25
Pilot Helmet, leather w/chamois earphone pads, new ..... 1.00
Allen Set Screw Wrenches, set of 5 ..... .15
Midget Variable Condensers. 3 sizes ..... ea .50
BC-610 Tank Coils, 500w w/swinging link ..... .50
Triple Pilot Light assem. R, W, Green ..... .49
RG-8/U Coax. 50ft length ..... 2.50
PL-259 Connector for RG-8/U ..... .35
Bakelite Sheets 6"x12"x1/8" thick ..... 3 for 1.00
Ceramic slug tuned FM coils, ..... 2 for .25
S-6 Bulbs 115v fit jewel lights ..... .12
Polystyrene, solid 2" dia. x 30" lg ..... .75
Tool Boxes from ..... $2.00
No. 40 DCC magnet wire 1 lb. spools ..... .50
4' ac Line cord & plug w/test clips ..... .25
10kv Test Lead Wire ..... per ft. .01
Instrument Knob. small 1/4" shaft. 1.25 value .24
PM Speaker, 6" ..... 1.95
PM Speaker, 10" ..... 3.95
PM Speaker, 12" ..... 4.95

Calif. residents add sales tax

**See Pappy Dow for Mica Condensers, Resistors, Allen Bradley Pots, Meters, Insulators, Selenium Rectifiers, Tubes, Oil Condensers, and many other items.**

## L R ELECTRONICS

**3529 E. Colorado St., Pasadena, Calif.**
**SYcamore 6-5521 RYan 1-9009**

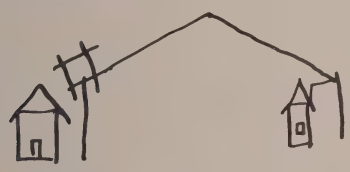
## . . . with the Young Ladies

continued from page 26

and would like the pages drop W5RZJ a note and enclose a couple of 4¢ stamps to cover cost of postage and heavy mailing envelope. They are slotted into the spiral binding. so quit putting it off now and get your orders in.

Ruth, K6KLN, has just been elected Sec. of the Crescenta Valley Radio Club. She is also the proud owner of a new Studebaker Lark, all her own!

The following is a copy of a composition written by Susan, the eleven year old harmonic of W6GQX and W6QGP and reprinted by permission of her parents. Mr. proofreader, please do not change one misspelled word.



HAM RADIO by Susan Barker

Ham Radio operating is a hobby, with a mike and reciver. My parents have talked to people in places like Antartica, Africa, New Zeland and other places. The Radio waves go from place to place as shown on the top of the paper. The ionized layers they bounce on are of electrcity. The sun does it. At night the electricity drops because the sun is gone. You can talk farther because the waves can bounce higher through the layers.

Also, people complain about the radio operators coming in on their TV and radio sets, which are usually old sets. This is because the sets are not made to work with Radio. The sets are on radio frequencies, you can have repellers machines put in cheaply.

I feel that further comment from me would be completely superfluous.

33, Jean

RADIO, TELEVISION SERVICING BASIC ELECTRONICS
"W7YC."
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909 4TH AVE.
SEATTLE, WN.

## LOUPIN THE LOOP . . .

Continued from page 21

to participate in this venture by Volunteering their club and operators to man this station (AM, SSB' CW and what have you) for a 24 hour period. If you would like more info, or just want to get on the list of active clubs, write to Ray Meyers W6-MLZ, 717 Anderson Way, San Gabriel, Calif . . .

The Western SSB convention came off in Santa Barbara on the 13-14 with nary a hitch. Al W6ZHH seemed to be everywhere carrying the ball as usual. Congrats to you and the rest of the committee, om . . . New members of The 50 Club are Ken Gulley ZPM, Martin Fox IXK and Ben Keefer LPA . . . and so on far into the night. Have hit the bottom for this one. Hp 2 C U all again next time . . 73 . . . Corky W6ORS

**ANNOUNCING:**

**Colossal Opening**

**Central California Amateur Supply**
**MODESTO, CALIFORNIA**

A much needed amateur institution is about to open . . . a mail order parts and components house strictly for amateurs. We are featuring new and excellent condition used surplus components for those fellows not located within driving distance of established surplus component firms. With a central location we are able to provide one day mail, UPS or freight service to most California points, and same day mailing on orders received from outside California. All components are guaranteed for service under normal operating conditions.

Watch for our first listing in the March issue of WRA.

**Central California Amateur Supply**

**WANTED**

**Opening for engineer or experienced practical amateur with ideas and a flair for engineering design of new products. Interested? Send background, salary, requirements, etc., to Globe Electronics, Council Bluffs, Iowa. Chance for opportunity and advancement.**

**Q5er PRICE SLASHED**
The hard to get 190 to 550kc Command Rcvr. Now only ..... $6.95

**HICKOK TUBE TESTER**
Late model 546 mutual conductance. Tests most tubes, including special purpose. Has complete chart and in excellent condition. Reduced to $49.50

**ARB RECEIVER**
Covers 190 to 9000kc. Includes dynamotor. Has many uses. Price reduced to ..... $13.95

**AC POWER SUPPLY**
110 volt supply for the BC-603 & BC-683 Receivers. Just plug in without any changes to set. ..... $9.95

**METER BUY!**
Here's a Lulu! 1½" square 0-1 ma meter. Late model type. New. Price slashed to only ..... $1.49 ea.

**AC SUPPLY**
AC Supply for the BC-1335. Has proper plug and hook up to use 1335 on ac power without internal changes in set. Look at this low price! Only $9.95

**HANDI-TALKIE CHASSIS**
Original BC-611 Handi-Talkie Chassis. Brand new boxed only ..... $3.75 ea. or 2 for $6.95
Same chassis brand new but with minor damages $2.75 each, or ..... 2 for $4.95

**FREQ. METER**
BC-906 grid dip cavity type frequency meter $4.95 ea

**MINE DETECTOR**
BC-625 mine detector. Comes complete in carrying case. Price slashed to ..... $14.95

**GENERATOR**
12 volt 30 amp small compact DC gen. brand new ..... $3.95

**VIBRATOR SUPPLY**
6 or 12 volt vibrator supply for BC-659 New condition ..... $3.49

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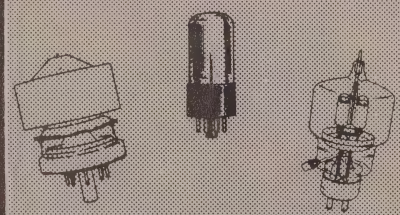

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## SIDEBAND

Continued from page 23

ence between SSB and audio and provided the tube capacities will allow the efficient handling of RF there is no reason at all why the same circuitry cannot be used. The biases, plate voltages, screen voltages, cathode resistors etc. may all be of identical value the only change being that now we use a tuned circuit instead of an audio frequency transformer. At the moment I am playing about with a Class B 807 setup identical with that often used in audio and modulator work where the signal is fed to the screen and the control grid is coupled to the screen through a resistor of about 20k. It is possible you may hear more of this later.

Another but less direct cause of splatter is that due to the incorrect C/L ratio in the final or other power amplifiers. As the amount of C in the circuit determines the Q and the Q determines the ease with which the tank circuit may be coupled to its load it may perhaps be readily seen that the amount of C in the circuit has quite a bearing on the purity of the output results. If the Q is made too high the circuit becomes very frequency conscious which means that you have to retune each time you shift frequency and also that the circulating currents in the tank circuit get high and the losses become excessive. If the Q is made low the tank circuit will be more difficult to couple into the load. You have to be neither for nor against and take the safe path between the wife and mother-in-law so to speak. Voltage amplifiers are far less critical concerning the amount of C in the circuit. But where power amplifiers are concerned its a must that you look up the good book and find the correct value of C for the particular type of operation and tubes you intend to use.

So much publicity has already been given to the necessity for using stabilized bias and screen supplies to power amplifiers it is hardly necessary for me to discuss this further. But perhaps the reason for these may not be altogether apparent. The question often pops up: Why should the bias be stabilized when we use a linear amplifier? The answer here is that when the tube draws grid current it naturally causes a voltage drop across the internal resistance of the power supply and the voltage drops. A lower bias voltage will cause the tube to operate on a different part of its curve and the output will be limited. Right at a time (of peak output) when the tube needs high bias the bias is reduced. This may be likened to an auto being starved of gas each time the need arrives to put the foot down to climb a hill. Screen regulation requirements are of course identical for the same reason. When the tube is called upon to amplify a fat signal it must not have its amplification ability throttled by a non co-operative screen which insists on dropping its voltage.

Other points which I feel I should mention are those concerning the restriction of the audio frequencies to something like 300 to 3000 cycles in phasing rigs so that the bandwidth is reduced; the need to make certain that voltage amplifiers are not driven beyond their grid base. This is something that may readily happen when receiving type tube amplifiers are used and which will not normally handle more than a few volts at the control grid.

The technical aspect of sideband (as compared to ancient history type of news) will be given a prominent spot on these pages.

I will welcome comments, suggestions and technical questions from Western Radio Amateur readers.

73 DE ZL1AAX

---

**I am pleased to see so many of the prominent dx'ers switching over to SSB. probably one of the most famous "holdouts" is Bill Orr, W6SAI. Bill says "Finally am sold on SSB. I can copy sigs on SSB when the a-m sigs are in the mush"; Bill should know, for he is currently (until summer) operating in Monte Carlo, Monoco as 3A2AF. Other high scorers on SSB are W6ENV (273 countries), W2HUQ (276), and W6ULS (199). Paul, 9G1CX did it big with an expedition to Togo (FD8DZ).**

---

**DX QSL Tip: Worried about your VS5BY confirmation? Send a self addressed stamped envelope to Floyd (W6ZEN). He will be handling cards as soon as the logs arrive.**

---

# SURPLUS BARGAINS!

## PROP PITCH MOTORS
For your beam antenna. 20 to 32 volt ac or dc 1/2 HP motor Gear reduction 7000-1 1 1/4 RPM. Very few left at this very low price of only ..... $14.95

## TEST SCOPE
ID-59/APA-11 Test scope, Synchroscope, Plus Analyzer. Excellent condition ..... $9.95

## HANDSETS
H-94/U Handsets (latest version of TS-13) Brand new $3.95 ea ..... 2 for $6.95

## HANDIE TALKIES
BC-611 Handi-Talkie chassis 3.95 ea. ..... 2 for $6,95

## SIGNAL GENERATORS
Measurements Corp. Signal Generator model 80. 2 to 400mc ..... $295.00
Measurements Corp. Signal Generator model 84 3000 to 1000mc ..... $249.00

## AC SUPPLY
110v ac power supply for BC-603 & 683. No conversion needed, just plugs in. Wired ..... 11.95

## R435/VRC-2X RECEIVER
Single channel 30-40mc mobile receiver. Xtal controlled, covers police and Fire Depts. Double conversion super-het Squelch, double limiter vibrator supply., Good condition ..... $14.95

## RECEIVERS
RAX-1 Receiver 200-1500kc ..... $17.95
RAX-2 Receiver 1500-9000kc ..... $17.95

## COMMAND EQUIPMENT
Huge stock of ARC-5 Command Equipment at sensational prices

## HICKOK TUBE TESTER
Hickok model 546 mutual conductance tube tester. Tests most tubes including special purpose. With chart. Excellent condition, Excellent buy at $69.95.

## ARB RECEIVER
190-9000kc ARB Receiver 4 bands. Very clean ..... $14.95

## PE-103 DYNAMOTORS
A few brand new PE-103 dyamotors left at the fabulous low price of only ..... $14.95

## TRANSFORMERS
Plate Xfmr. 115-230v 50/60cy pri. 280vct ½amp, and 120v bias winding. Hermetically sealed xlnt cond. ..... $7.95

Vibrator Xfmr. 12v 135vdc output at 118ma, or can be used as 6 or 12 volt filament xfmr when wired backwards. Hermetically sealed brand new ..... $1.95 or 3 for $5.00

## ARR-2 RECEIVER
Excellent condition, includes all tubes. Can be converted to 2 meter rcvr. or conelrad. See Jan. 57 WRA, Aug. 57 WRA ..... $1.95 ea. 2 for $3.00

## CAPACITORS
120mfd 3000 volts ..... 69.95
80mfd 4000 volts ..... 49.95

## RANGE CALIBRATOR
1-223A Range Calibrator. 115v 60cy input. Complete with tubes including 2 6L6's. Can be made into a nice push pull amplfier. Brand new ..... $4.95

## MODULATORS
MD-7 ARC-5 Plate modulators. Going fast at this low price ..... $6.95

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### POWER TRANSFORMER

Stancor P-4004, 107 or 117 volt, 60 cycle input. 800 vct at 175 mils with 80 volt bias tap. 5/3,6.3/2.5,6.3/2.5 and 2.5/1.75. Reg $12 net value New and packaged.

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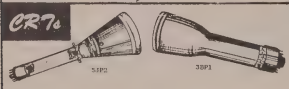
### CRT

Lots of 'em, all new and boxed to ship.

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| 3BP1 | 1.75 | 5FP7...ppd. | 1.29 |
| 3FP7...ppd. | 1.00 | 5FP11A.ppd. | 2.50 |
| 5BP1 | 2.45 | 5JP1 | 2.45 |
| 5CP1 | 2.45 | 5JP2 | 3.45 |
| 5CP7A | 7.95 | 7BP7 | 2.95 |

### RECTIFIER $1.79

Full wave selenium, HS in oil; 33 volt input, 24 volt DC output at 800 mils continuous rating. New and boxed by mfgr.

### ATTENUATOR 59¢

Type AB L-pad manufactured by Ohmite. Resistance of front section is 6000 ohms, rear 5500 ohms. Flatted shaft 1/4" by 11/32" long.

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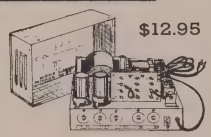
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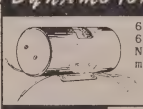
RA-87....Input 95-125 or 190-250 volts AC, 60 cycle. Output is 115 volts DC at 400 mils rated. With cover and line cord, reconditioned by the Signal Corps for re-issue; looks just like new.

### DYNAMOTOR
For you owners of Volkswagens


6 volt input; output 600 volts at 150 ma. New in original pack; manufactured by Eicor.

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### FILTER $1.95

Low pass.....Passes 300 to 2500 cycles, 3 db. Rejects 3200 cycles down 40 db min. Reference frequency is 1000 KC. Hermetically sealed.

### METER $4.95

0-50 microamps, ruggedized beauty by Burlington, model 921. New in manufacturer's package. Fits 2.21" hole.

### SWITCH 29¢
4 for 95¢
$2.45 a dozen

Rotary, 6 pole, 3 position with phenolic insulation. Compact with 1/4" shaft 13/16" in length.

### SELSYN

Rugged, heavy duty style manufactured by Delco. Type II-4, C-56701 for 115 volt, 60 cycle use. Brand new; stripped weight is 10 pounds.

$9.95
$17.95 a pair

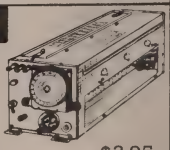
### AUDIO TRANSFORMER

A combination mike and output transformer. Mike section pri. 40 ohms, sec. 5K ohms, 0.1 watt. Output section, pri. 25K ohms, sec. 600 ohms, 0.1 watt. Mike current 4 mils, output pri. 1.5 mils. HS and very compact.

49¢

### RHEOSTAT 49¢

50 watt, 350 ohm +/- 10%, 1/4" by 2-1/2" flatted shaft. Ceramic insulation; mfg. by Ohmite.

### RECEIVER

RU-16, CW-46051 This one is a steal because we are out of the coil sets. If you have or can get the coils, you're in. Very nice condition, with all tubes.

$3.95

### PLUGS 12 for 95¢

Banana plug - black sleeve

### POTENTIOMETER

100 ohms, 4 watt variable wire wound; 1/4" shaft for knob or screwdriver.

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## CLUB MEETINGS

Continued

SAN FERNANDO VALLEY RADIO CLUB W6SD meets 1st & 3rd Fri. ea. month 7:30 p.m. Van Nuys Playground, 14301 Van Owen St., Van Nuys, Calif.

SAN FRANCISCO RADIO CLUB meets 4th Wed. ea. month Forest Hill Lodge, 266 Laguna Honda Blvd. San Francisco.

SAN GABRIEL RADIO CLUB INC. W6QFK meets 1st Tues. ea. month at Bowling Green Club House, Arcadia Park.

SAN GORGONIO PASS AMATEUR RADIO CLUB meets 2nd Monday ea. month 700 Magnolia Ave., Beaumont, Calif.

SANTA BARBARA AMATEUR RADIO CLUB meets 3rd Fri. ea. month 7:30 P.M. Recreation Center. Anacapa and Carrillo Sts., Santa Barbara. P.O. Box 273.

SANTA CLARA COUNTY A.R.A. meets 8 p.m. 2nd Monday ea. month, 171 W. Mission., San Jose.

SAN MATEO RADIO CLUB INC., meets 8: p.m. 2nd Wed. Red Cross Bldg. Burlingame

S.C.A.R.S of Redwood City, Calif.: meet the 4th Monday 8: p.m. in Veterans Memorial Bldg. 1455 Madison, Redwood City. All interested in ham radio invited.

SILVERADO SIX SHOOTERS meets last Thurs. of month at Vets Memorial Bldg. Napa, Calif. Net night Tues.

SOUTH EAST AMATEUR RADIO CLUB meets 3rd Fri. ea. month 8 P.M. at South Gate Civil Defense Bldg., corner Post and Victoria.

SO. CALIF. DX CLUB meets 1st Thurs. each month, Cliftons Cafeteria. 8th & Spring Sts. Los Angeles, 8 p.m. 2nd floor.

SO. CALIF. MOBILE CLUB meets for xmtr hunts Pasadena area every Sat. night 7: p.m. 50.7mc

SOUTHERN NEVADA AMATEUR RADIO CLUB meets 8 p.m. 2nd & 4th Fri. each month at auditorium, Victory Village, Henderson Nevada.

TRI COUNTY AMATEUR ASSOC. meets 2nd Thurs. ea. month, Washington Park Aud., 7:30 p.m., Pomona, Calif.

TWO METER & DOWN RADIO CLUB meets 1st Wed. ea. month at Plummer Park, Long Hall, 7377 Santa Monica Blvd., Los Angeles..

UPPER TEN RADIO CLUB meets the first Tues. ea. month Red Cross Bldg. 3650 5th Ave., San Diego, 8:00 p.m.

UNITED RADIO AMATEUR RADIO CLUB meets 3rd Fri. ea. month at Wilmington Hall, 435 N. Neptune, Wilmington.

VALLEY RADIO CLUB meets 1st & 4th Fri. ea. month in the Community Center Puyallup, Washington.

VISTA AMATEUR RADIO CLUB W6VPU meets first Wed. of each month. Contact K6LKQ PAlace 4-2325 for information and location.

WEST VALLEY AMATEUR RC meets 1st Tues. & 3rd Thurs. 8 p.m, Cambrian Elementary School, Campbell, Calif.

WEST VALLEY RADIO CLUB meets at Whitsett Hall, 14955 Saticoy St., Van Nuys, Calif. 1st and 3rd Fri. at 1930.

WESTCHESTER AMATEUR RADIO ASSN. K6EBN meets 1st and 3rd Mon. ea. month at 8301 Dunbarton Ave. Code classes every Mon. 7 P.M. Contact W6MTQ for details ORchard 7-1012.

WHITTIER 50 RADIO CLUB meets 2nd Fri. ea. month dinner 6:30 p.m. at Oak Room, Hoover Hotel; meeting at City Hall, Civ. Def. room, at 8:30 p.m.

L. A. YL RC meets 2nd Sat. each month 12:30 Schabers Cafeteria, 720 S. Hill St., L.A. No meetings in July or August.

ZERO BEATERS RADIO CLUB meets 1st and 3rd Thurs. at 8 P.M. Yosemite Playground at Eagle Rock.

—o—


## QST - QST from K6BP

**For all San Joaquin Valley-Sacramento Valley hams**

Winter time is building time and this winter is no exception. With warm weather still six weeks away you have many excellent evenings left to put together that special piece of gear you have been dreaming about. And Fulton's Radio Service is the place to find the best quality parts for the least capital outlay. What we list here each month is just a mere sampling of what is stocked in our warehouse. If you think these prices are competitive, hop into the mobile and drive out to see what a real parts house can save you, $$$ wise.

**FEBRUARY SPECIALS**

Collins Filter Choke, 6Hy at 150 ma, case lots $.30 ea. Single items, ..... $.45 ea.
Filament Transformer, 5 volts at 4 amps, $.75 each.
Filter condensers: 20MFD, 450 V, ..... $.20 each.
Dual-55MFD, 55MFD at 300 v ..... $.20 each.
Variable: 75MMF, 600 v, double spaced .... $.25 each
APR-1 Receiver: One tuning drawer, Good Operating condx, looks good. ..... $35.00 each.
Large selection of Filter cond. from 30MFD down. Good prices.

As we write the following used receivers-transmitters are in stock at VERY realistic prices. Price us before you buy in the city. Low overhead plus good common horse sense means a better deal for you SX101's NC-300's, HRO-60, HRO-50TT, S-76, S-85, S-40,40B, SX24, S38B; NC-125, HQ129X, Harvey Wells TBS 50-C, Johnson Viking , Viking 1, B & W 5100, Globe Scout 65A, Viking Mobile.

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EF Johnson, Gonset, Hallicrafters, National. Check with us for immediate delivery on new gear. REMEMBER—Everything is completely guaranteed at Fulton's. Don't be fooled by ads. Inspect what you buy.

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AM FM Tuners from ..... 39.95
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Atlas mike stand ..... from 1.92
Picture tube brightner ..... .89
TBY 4 volt batteries, new ..... 4.50
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Shakespear Wonderod Mobile Whips, 72, 84 96 inch ..... 6.95
807/5933 Tubes, brand new ..... 1.95
Filament xfmr. 24v 10a ..... 5.50

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TYPICAL RF OPERATION, CLASS C

| | ICAS | ICAS |
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| Frequency | 60 | 175 Mc |
| DC Plate Voltage | 750 | 400 volts |
| DC Grid No. 2 Voltage | 160 | 190 volts |
| DC Grid No. 1 Voltage | 62 | 54 volts |
| Peak RF Grid No. 1 Voltage | 79 | 68 volts |
| DC Plate Current | 120 | 150 ma |
| DC Grid No. 2 Current | 11 | 10.4 ma |
| DC Grid No. 1 Current | 3.1 | 2.2 ma |
| Driving Power | 0.2 | 3.0 watts |
| Plate Dissipation | 20 | 25 watts |
| Power Output | 70 | 35 watts |
| Efficiency | 78 | 58 % |

*Other ham favorites by* **Amperex:**

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|---|---|
| ECC81/12AT7 | Low-noise, medium-$\mu$ twin triode |
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| ECC83/12AX7 | Low-noise, high-$\mu$ twin triode |
| 6360 | High-sensitivity VHF twin tetrode; 14 W anode dissipation |
| 5894 | High-sensitivity VHF/UHF twin tetrode; 40 W anode dissipation |
| 866AX | Mercury vapor rectifier |

*At all leading radio parts distributors*

*ask* **Amperex** *about extra-quality ham tubes*

**Amperex** ELECTRONIC CORPORATION
230 Duffy Avenue, Hicksville, L. I., N. Y.


TA2

Continued from page 12

One station said recently "my S meter shows S3 but your audio sounds like 20 db's over 9".

I do not want to go into detil on DSBSC except to say that the results have exceeded my expectations. Anyone familiar with the technique of receiving SSB has little or no trouble with DSBSC. By using the crystal filter or Q multiplier to sharpen the band width, most of the unwanted sideband is eliminated and phase distortion caused by being slightly off in tuning is relatively small. Reports on my signal, with reference to the audio and cleanness, have in almost every case been most complimentary. Most SSB "types" say that they are all for anything that eliminates the carrier.

Now on the practical side of things, I will try to give sufficient information so that without test equipment you can duplicate my results. For best results your receiver should have good frequency stability and should have at least a crystal filter, Q multiplier, or some other method of giving you sharp band pass. Two to three KC's is about optimum. If you would like to check your receiver on some SSB signals, back off the RF, gain, open up the audio gain wide and turn on the BFO. For best results I tune my BFO pitch control approximately 1000 - 1500 cycles plus or minus depending on the sideband (upper or lower) and tune the receiver for best audio. The BFO pitch control can be trimmed slightly for best results. It is not too serious as far as the intelligibility is concerned.

The exciter used in my case is a rebuilt Command Transmitter (BC457) with 1 - 3 watts output on 40, 20, 15 and 10 meters. The only requirements to remember here is that the *oscillator should have good frequency stability.* Crystal control would beat the stability problem but since most SSB contacts take place on the same frequency, sooner or later you will want to go VFO.

---

Next month we will bring you detailed building instructions, and tune up procedures for any of the TA2 Special variations.

**Patronize Our Advertisers**

Continued from page 24

him at 110 Argonne Ave., Long Beach, 3, Calif.

The DX club hopes to operate in March from Socorro Island about 800 miles S of SD. It is an uninhabited group of rocky islands 18 deg N 112 W belonging to Mexico. It is 420 miles off the coast of Colima, Mexico. The island itself is 24 miles long and 9 miles wide and has an extinct volcano 3660 ft. high to set the beam up on. It was named after a Spanish Viceroy governor of Mexico in 1746-1755. More next issue, sorry we have run out of space — please please write and send me pictures and any dope around SD county. PLEASE. 73. Ed.


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**FOR CASH**

**OR SWAP FOR HAM GEAR**

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store no. 3 18841 Ventura Blvd.

**ROBERT'S MOVING DAY SPECIALS**

Robert's Surplus is currently in the state of moving to new and much larger quarters. Our present warehouse contains 5,000 sq. feet of storage-browsing room. Our new warehouse has 30,000 sq. feet of browsing space, and all parts and bulk materials are spread out in an easy to see manner. This means that we are now better equiped to serve your needs, and you will be better able to see what we have to offer you. Just imagine 30,000 square feet of electronics goodies!!!

**GUY WIRE:**
500 pd test aircraft stranded control cable $.02 per foot, ..... $7.50 per 1000 feet

**RECTIFIER POWER SUPPLY:**
Model EL-2. Input, 115v 60 cycle. output, DC - 135v at 10ma. 90v. at 5 ma. 3v. at 360ma. Bias . output: Minus 15v. minus 6v.

**TRANSFORMER SPECIAL**
3"x3"x3" midget. 110v 60 cy input. output: 6v at 4 amps, 12v at 3 amps, 24v at 2 amps ..... Only $1.95 ea.

**VHF TRANSMITTING TUBE SPECIAL**
829-829B (no choice) limited Quanity, Guaranteed Quality. First come, first serve. ..... $2.50 ea.

832-832A (no choice) limited quanity, guaranteed Quality. First come, first serve. Only ..... $2.50 each.

**UHF LIGHTHOUSE TUBES**
GL446A Guaranteed, New un-used. Fabulous Bargain ..... $1.00 each.

$3.00 minimum order. Sent best way, FOB, Oakland

**New Location: Effective Feb. 28**
**Building 621, Oakland Municipal Airport, Oakland, California**
**Just 2 blocks south of old location**

## CLEARANCE SALE

**Meter**

Triplett AC Volt & Output Meter. 5 ranges. 1, 5, 6, 60, and 150v. **$2.95**

**8002R TRIODE**

Up to 3 kw Class C at 120 mc. Brand new. **3.95**

**WELDED CABINETS** **$14.95**

68 in. high for std. panels. Used, good cond.

**CHASSIS BRACKETS** **25c**

12' x 7"

**COAX RELAY**

SPDT, 24v coil, excellent condition ..... **$3.50**

**POWER SUPPLY**

400vdc .200a, 4-6.3v total of 12a. Transformer, choke, cap. on chassis. Requires slight wiring. Ex condition ..... **9.95**

**FREQ. METER**

TS-173/UR Freq. Meter. 90 to 450mc. .01% acc. ..... **89.50**

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WEbster 3-8523

Week Days 9:00 a.m. to 5:00 p.m. Sat 9:00 a.m. to 1:00 p.m. 3 blks E. of LaCienega


## TV Antennas and 300 OHM LINE

Not too long ago a well meaning ham dropped into the shop to see what we had in the way of APC variables for his new six meter converter. Browsing around amidst the 3500 square feet of new and used surplus components he spied my stock of Winegard Color-Ceptors, which is, to the un-initiated, one of the better Models of tv antennas for fringe area reception.

"Why do you stock these modulated milk bottle ether catchers, Dutch", he asked me.

"To sell them, of course" was my answer.

"Do hams buy them", he retorted.

"Not usually, I replied, " lots of psuedo electronic technicians drop in here and decide to have a go at better TV reception".

His eyes narrowed. "And I thought you were in business for hams only, but now I see that you are like all the rest. Just trying to make a buck anyway you can".

"My fair friend", I began, "the type of fellow who drops in here and purchases these super hot tv antennas is just the same fellow who runs to the tvi committee the first time his vertical hold slides. Bringing him into the store I get the chance to acquaint him with ham radio enough so that he at least has the decency to call the local ham on the phone and try to work out the problem. In short, I bait him just enough to develop his interest. You would be surprised how many of these fellows drop into the store a week or so later inquiring as to how they can become a ham".

(Eds. note) You know fellows, Dutch has something here. Our obligation as a ham dosen't stop with services to our fellow hams. It extends beyond that, to helping the layman better understand this electronics business.


# BILL'S Electronics

**130 E. First** **Livermore, Calif.**

**HI 7-5888**



MINE DETECTOR

Army SCR-625 Mine Detector. Complete in carrying case. Excellent condition. Many uses ..... $19.95

DYNAMOTOR

6VDC input. 425V at 375MA out Excellent cond. $7.95

FILAMENT XFMR.

Utility Filament Transformer. 6, 12. 24, 32 VAC. 3 amps. Brand new potted ..... $1.00

COLLINS PLATE XFMR

Collins Plate Transformer mfg. by Chicago. 2000vct 200MA, or 1000VCT 200MA. Will handle 500MA intermitently. Potted, brand new ..... $6.95

ARB RECEIVERS

190-9000kc ARB Receivers. 4 bands. Beautiful receiver, ideal for home or car. xlnt ..... 14.95

VIRBATOR SUPPLY

Mobile vibrator supply. 12vdc. input 4 amps. 300vdc at 100ma out. Cornell Dubilier. New ..... $4.95

ARC-5 MODULATORS

MD-7 push pull plate modulators. Xlnt. con .... $7.95

CAPACITOR ANALYZER

Oxford Tartak deluxe model CT-400 Capacitor Analyzer. 115v 60cy Excellent condition. Great buy $12.95

5 METER OR FM RECEIVER

This is a Lulu R-156/ARR-16 60-80mc FM Communications receiver. Great for 6 meters or FM Radio. Easily converted to AM. Excellent condition $12.95

FREQUENCY METER

BC-906 Grid Dip Frequency Meter. 143-225mc. Excellent condition ..... $6.95

HICKOK TUBE TESTER

Late model Hickok portable tube tester. Mil version of model 600. Tests practically all types of TV and spec. purpose tubes, Xlnt cond. ..... 69.50

VIBRATOR PACK

PE-117 vibrator pack for BC-659. 6 or 12v input, new ..... $3.95

HANDI-TALKIE CHASSIS

BC-611 Handi-Talki Chassis. Brand new boxed, less tubes ..... $3.95

DYNAMOTOR

PE-103 Dynamotors. 6 or 12v input. 500v 200ma output. Like new condition ..... 12.50

APR-1 CHASSIS

APR-1 Receiver Chassis. Xlnt cond. tunes 38 to 1000 mc by use of plug in RF tuning units ..... 24.50
TN-1 Tuning Unit 38-90mc ..... 14.95
TN-2 Tuning Unit 90-300mc ..... 14.95
TN-3 Tuning Unit 300-1000mc ..... 22.50

LM FREQ. METER Q

125kc to 20mc. Excellent cond. with original calib. book and crystal ..... 39.95

2 METER XMTR RCVR

SCR-522 100 to 156mc. Excellent for 2 meters. Complete with tubes, excellent condition ..... 14.95

RA-62 POWER SUPPLY for SCR-522. 110 vac. Like new ..... 24.50

POWER XFMR SPECIAL

110vac 60cy pri. Sec. 550vct 120ma, 6.3v 11a, 17v 1.2a, 5v 3a. Brand new potted ..... only 95c

OIL CONDENSERS

4MFD 600V ..... .49 4MFD 2500V ..... 2.95
4MFD 1000V ..... .95 10MFD 600V ..... .75

COMMUNICATIONS RECEIVER

BC-312 Communications Receiver. 1.5-18ms, Complete with 12 volt dynamotor. Excellent condition $39.50

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**STanley 7-3185**

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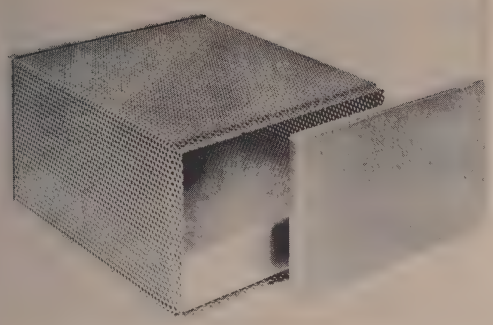

California Chassis Company, 5445 East Century Blvd., Lynwood, Calif. is now manufacturing a new line of perforated cabinet chassis. These cabinets have a heavy chassis and hammertone panel, and are ideal for TVI prevention. The regular line are horizontal and called the LTC. They are also available in the vertical position. Write California Chassis Co. for more information.

## Patronize Our Advertisers


**QSL's by W6CMN**

Send 25c (refundable) for samples

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6707 Beck Ave. N. Hollywood Calif.


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# Ham Ads

Amateur want ads 2¢ per word.
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QSLs send 25¢ (refundable) for samples. Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

HANDLING TRAFFIC? Two bucks brings you the Pacific Area Net News for one year. Vic Gish, W7FIX, 511 East 71st. Street Seattle 15, Washington.

FOR SALE: Magazine subscriptions, QST-$4.00; CQ-$5.00; Western Radio Amateur $2.00. Or any magazine you can think of Playboy, Esquire, Life, Sat. Evening Post, Time. Write for prices or phone-Gene Silvey, W6COZ at NA 2-0542. 636 N. Gordon St. Pomona, Calif.

WANTED: Hallicrafters S-38D, Gonset power supply #3069-6V. Bill Rice, Box 631, San Bernardino, Calif.

FOR SALE: National NC183D receiver. Clean, mint condition. Sells new for $449. Asking $225. Ed Scholz, WA6BSM, WE 1-6909 evenings or weekends.

FOR SALE: Brand new Tapetone XC-50-C4 six meter converter for Collins 75A-4. $50. Larry Kleber, K9LKA, Belvidere, Illinois.

KW power supply, grounded grid linear 803's, B&W 850 pinet, in 42" cabinet on casters, five meters, with 500 and 200v supplies $150. 20-675 mmf 10 KV Jennings vacuum variable with Groth turn counter $30. SX-71, Heath Q-Multiplier, speaker $150. Drenon, W6FXV, 4532 Teilman, Fresno, Calif.

FOR SALE: Temco 75 GA xmitter in factory sealed crate. Cost $550. will take $400. Bill Rice, Box 631, San Bernardino, Calif.

BUY OF A LIFETIME: Collins 75A3--Like new condition. Just re-aligned completely at Collins. Has brand new matching speaker plus crystal calibrator $375. Collins 75A2 like new with matching speaker $285. SX-100, brand new 6146's never been used except as driver, in fine condition $150. D104 push to talk $15. Heath AC-1 $5. Drake phone patch $10. Alliance tena rotar $10. Don Cordray, 6146 Amestoy Ave., Van Nuys, Calif. DIckens 4-1736.

RUBBER STAMPS OF ALL KINDS: Special nickel plated pocket stamp, 3 lines and call. $1.50. Howard Rapple, WØVRB, 608 N. 10th. Humboldt, Iowa.

HEATHKITS now in local stock!!! Exclusive at Kierulff!!!820 W. Olympic Los Angeles.

FOR HIGHEST QUALITY QSL's, call or write Duke, K6GJU, 10422 Townley, Whittier. OX 5-1274. Kromcote, Multicolor, special cuts our specialty.

WANTED: Old radio and wireless sets and parts. 1928 or before. Crystal detectors, crystal sets, tubes, tuning units, parts, old battery receivers catalogues, magazines, books. All letters answered. Will pay cash or trade. Harold S. Greenwood, 2341 Ivyland Ave. Arcadia, Calif. DOuglas 7-7217.

SCENIC QSL's, New, Different! Samples, 10¢ refundable. Camas Press, 3005-VC, North Hollywood, Calif.

TRADE: Hammond Solovox organ, not new but complete and good. Want commercial all band mobile transmitter. W5YNL, 3113 No. Columbia, Plainview, Texas.

ATTENTION: Mobileers! Leece Neville 6 volt 100 amp system alternator, regulator & rectifier, $45. Also Leece Neville 12 volt 100 amp. system. Alternator regulator & rectifier, $85. Good condition. H.A. Zimmerman Jr., K2PAT, 115 Willow Street, Brooklyn, N.Y. ULster 2-3472.

FOR SALE: Almost new Johnson 500 with power supply $775. Collins 75A4 $425. High Patch $22. Clipper $25. 2 meter Gonset Communicator II $150. Elmac transmitter, 2 mikes, key. Regency transistor radio & converter never used both $100. Other items. Wilma Katz, AXminster 2-7755, evenings.

Tubeless VFO for Communicator $4. Preamplifier printed board circuit for Communicator $6. will raise signal about 2 S units. 25 ft. tapered (1¼" to 2") iron mast $2. Signal generator needs battery power supply 550kc to 30mc $3. miniature 2.1mc to 6mc pocket receiver battery operated with helmet earphones. Hot receiver uses 2 ft antenna extra set batteries $15. Pair highway blinking signal lamps with suction cups, plugs into cigar lighter $1. takes both. Communicator I cabinet $3. Push to talk carbon mike RS-38 $1. POplar 2-7060.

WANTED: For Hallicrafters SX-32 receiver. Band spread dial scale #83-116. Front panel. RF antenna coil, band 4 5.3 to 11mc #51365. John Bothwell, K6LNO, 2620 Foothill Drive, Carmichael, Calif.

WANTED: Regency ATC-1 amateur band converter. Larry Kleber, K9LKA, Belvidere, Illinois.

Meet your QSL printer face to face at Hagerty Radio, 2926 W. Magnolia Blvd., Burbank, Calif. Bring your needs and beefs to W6CMN, 73, Bill.

FOR SALE: 2 meter yagi's. 2 meter equipment. Elmac AF67 with power supply, TV sets, receivers, transmitters, modulators, test equipment, mobile transmitters, dynamotors, surplus, etc. Moving to new house and can't take shack. Everything goes. 1833 So. Vega St. Alhambra.

AQ-129X for sale: Good condition, with speaker $130. Will take NC-57 or equivalent in part trade. Never used galvanized 50 ft Pelevue crank up tower. Cost $214., asking $169. W6DXF. Arcadia. HI 7-6165.

CLEANING HOUSE BEFORE SPRING: The following pieces new. F.M. antenna & leads $5. BC1066A receiver & canvas case $5. TS24/ARR2 portable oscillator tester $6. BC709C interphone amplifier $3. ZB antenna $1. Radio beam filter $3. The following pieces are used but work, BC1206 CM Setchell Carlson beacon receiver one complete with tubes one less tubes $6. for the pair. Fisher power supply 32vts DC with schematic $5. CRV 60025 metering kit $4. T.C.S. remote speaker $5. Two R4/ARR2 receivers and control boxes with tubes $4. ea. 7 misc control boxes $4. for the lot. 5 loading coils $3. for the lot. 0 to 15 AC meter $1.50 0 to 15 DC meter $1.50. AN 40 antenna $1. Ohm meter $2. Low voltage circuit tester for car 6 or 12 volts tests starter, generator regulator or battery $5. FM tuner 52 to 62 mc $8. AN 26AIC interphone amplifier $3.50. 1 phono amplifier $5. Heathkit FM tuner ready to go $25. Heathkit handi tester needs work $5. R 74/CRW2 receiver $5. Manual for model SCR 522 $1.35. Manual for SCR183 and SCRAL283 $1.35. Webster Chicago tape recorder with Electro Voice mike and some tapes $45. L.G. Schwenneker, 1041½ E. Providencia, Burbank, Calif. Phone TH 2-5306 or TH 6-7160

Preserve forever the happy memories of baby's first steps. Baby shoes - mementos electro bronze plated. W6AEJ, Vitzel Bronzing Company. 8107 So. Broadway, Los Angeles 3, PLeasant 8-6503. Visit, phone or write for prices and brochure.

SELL: SX28 receiver. Also 400 watt 813 transmitter, other parts. Wm. D. Dean. K6QXC. 813 Ridgeside Dr. Monrovia, Calif. ELliott 9-5220.

Regency transistor ham band converter, like new $49. Heath AR-3 receiver, excellent $25. Dow 115vac coax antenna relay $7. Cubex 10 & 15 meter quad antenna, complete $18. Ameco practice oscillator $6. Meissner signal shifter, good shape $18. W6VIV, 845 Darrell, Costa Mesa. Phone LIberty 8-1679.

T.N.T. SUBSCRIPTION SERVICE, 1451 Raymond Ave. Glendale 1, Calif. I handle all popular and ham magazines, new or renewals. Terry N. Tatum, W6LKJ.

FOR SALE: Louvered metal cabinet with front and rear doors. Beautiful for field day portable, walkie talkie, or tv camera case, $5. Match pair of URC-4 transceivers on 145.72 mc crystal controlled for novice use. Complete with spare batteries, tubes, and cables, $100. Two transistor VFO ($10), audio oscillator ($4), and transistor osc. ($4), see Aug. 58 CQ mag. page 65. 12 volt coax relay $4. See Nov. WRA. Original "Semiconductor Space Spanner" transistor transmitter-first WAC with true QRP, includes batteries, meter, and all coils for 20,15,10 meters $35. Six meter transistorized walkie talkie, runs on four flashlight cells with a transistor power converter. Three transistor receiver, two tube xtal controlled transmitter. TCRA club project $75. Big box full of Command Set spare parts, coils, i-f cans, capacitors, dials etc, first $5. takes all. Signal generator 100 kc to 100 mc complete with sensitive output meter for setting level $15. Hi-Fi microphone, RCA ribbon velocity type with two stage transistor pre-amp constructed in base, worth $150. Make offer. Table top rack-panel enclosed cabinet, Bud model RC-1749. Make offer. Don Stoner W6TNS. P.O. Box 137 Ontario, Calif.

MORROW arm-chair ham shack including MBR-5 receiver, MB560A transmitter, TS-600S power supply with speaker, Conelrad CM-1, Astatic D-104 mike with push to talk stand. Mobile and portable mounting hardware. Home built 20 meter ground plane antenna. 40 ft RG-8U coax cable $350. takes all. VI 9-4641 days, EMpire 4-1033 evenings. Fred Richey, 10311 Vincennes, Sepulveda, Calif.

FOR SALE: AF67 transmitter, PE-103 600-D mike relay. Best offer. John Cochran, Clinton 5-8276.

DC to DC converter, transistorized input 6vdc, output 310dc at 150ma. uses two N441, four 1N1695, 70% efficient $30. Dick Johnson, call GIlbert 8-7940, 5010 Farago, Temple City, Calif.

FOR SALE OR TRADE: AF67 10 meter mobile Johnson whipload 6 and 2 hearing aids (transistor acousticon) all in good condition. Prefer crank up tower and rotator or 2 meter mobile gear or what have you? K6YUV Bob Raidy TRiangle 5-7047, 107 No. Encina Ave., Rialto, Calif.

FOR SALE: DX-100 equipped with differential keyer, antenna relay, 1200 uufd variable load condenser. VFO turns off when using xtl. An exceptional buy at $185. W6GMC, EL 8-0831.

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FOR SALE AND OR TRADE: Black Widow transceiver, in new condition. Model #6146PA with assoc. 115v 60 cycle power supply. Ideal for mobile or fixed station. Hewlett Packard #130A oscilloscope in new condition approximately 1 year old. Complete with manuals and hv probe etc. Asking approximately half price. Misc smaller items such as high quality mikes, etc. Consider trade for high quality tape equipment or professional audio equipment. Need multiple track recording or play back equipment. David R. Hooker, W6GYI, 2470 Morslay Rd., Altadena, Calif. SY 8-5154.

FOR SALE: SX-88, improved performance. Appointment for demonstration. Now using 75A4. This excellent SX88 sacrificed for $375. W6GMC, EL 8-0831.

FOR SALE: National HRO-5TA1 original owner. Perfect condition. A real hot receiver, very stable and excellent signal to noise ratio complete coverage 1.7 thru 34 megacycles with bandspread on all ham bands. Best offer over $100. W6LWN, 9306 Ellswick Ave. Los Angeles 45, Calif. Phone ORchard 0-1261.

20A with VFO $190. Globe LA-1 final $95. Both for $270. Will deliver 100 miles. C.W. Snow. RA 8-1532. Rt. 2 Box 186, Fallbrook, Calif.

STATION FOR SALE: Changing QTH, Hallicrafters SX-96 with matching speaker, factory wired Viking Ranger, Dow-Key T/R relay with speaker cut-off, crystal mike, key, 3 12 gauge copper wire antennas for 40-20/15 meters with 3 52 ohm transmission lines. All fittings and cables complete. Working station. Will deliver and help install within reasonable distance. Approximate trade value of xmtr and rcvr alone $425. Yours for same. K6PXH, Jim Murphy, GIlbert 8-6806, Rosemead after 5 pm.

WANTED: 4-250A tubes. State condition, price, first letter. Larry Kleber, K9LKA, Belvidere, Illinois.

FOR SALE: KWM1, complete mobile and fixed power supplies, speaker, rack. Best offer over $1000. PE-103 $15. Mobile cubical quad $20. HIllcrest 6-3630 evenings only.

SELLING COMPLETE STATION: Factory wired Viking II and VFO. Johnson LP filter, National NC-183 receiver, 3 element 10 meter beam and 40 ft telescoping mast with heavy duty CDR rotator, crystal calib. All excellent condition $400. EDgewood 9-2484. 4448 Glenfinnan Ave. Covina.

AIRPLANE: Luscombe 8A 65hp, all metal, 2 place. Late 1947. Less than 1000 hours. TT on engine and airframe. New tires. Good glass, etc. $1600. Don. W6JRE. GIlbert 8-2119. 10517 Haverly, El Monte.

90 watts for 90 dollars. Globe Chief, WRL VFO, WRL UM-1 plate modulator. All like new. Also for sale, Hy-Gain vertical 12 AV new. Phone OXford 2-6001, evenings, Sundays. Joe, W6ZAM.

QSLs Double or single call cards $6. for 500. Walt Walter, K6VDL, 1331 Westmoreland, Los Angeles, Calif. DU 7-5971 after 6 pm. and Sat. & Sun.

FOR SALE: Need money bad. 32V3 mint condition $550. Tears in my eyes at that. Hallicrafters world wide portable TW-1000 beautiful shape $125. SX43, best one you will ever see $125. Everything works, FM, 6 meters etc. Both SX43 and TW-1000 aligned by a real pro, namely me. Also Hallicrafters HT-7 freq std. $25. RCA KW modulation transformer $30. 'Judge' Glanzer, K7GCO ex WØLMB, 202 S. 124th. Seattle 88, Wash.

FOR SALE: DX-20 Modified for plate modulation. 6146 in final. Rack mounted power supplies. Heathkit VFO with vernier dial. All for $50. Al Lee, W6KQI, 2923 Greentop St. Lakewood, Calif. HArrison 9-2197.

HAMS— Make every QSO a solid one with a custom antenna! Custom made to the frequency of your choice!! 80-40 meters $11.50. 20-15-10 meters $9.50. Specify either dipole or folded dipole. Each antenna is supplied with 35 ft. lead-in (72 ohm coax for dipoles or 300 ohm twinlead for folded dipoles) and necessary insulators and connectors. This is not a kit!! Complete-ready to go on the air. All antennas shipped postage collect. When ordering please specify frequency desired. No C.O.D.s. Send orders directly to: Seymour Enterprises, P.O. Box 2046, Downey, Calif.

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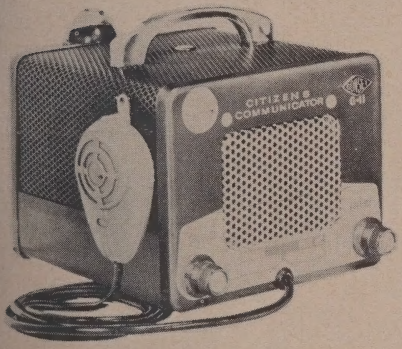
# *NOW!* The GONSET G-11

## CITIZENS' COMMUNICATOR




**THERE ARE HUNDREDS OF USES FOR THIS COMPLETE 2-WAY RADIO STATION ON THE NEW 11 METER CITIZENS' BAND**

**This new G-11 model is a precision built, rugged, fool-proof unit that meets all field and F.C.C. requirements. Both receiver and transmitter are crystal controlled for highest stability. No tuning. Simple one-hand operation with press-to-talk feature leaves other hand free while using set.**
**SPECIFICATIONS:** POWER-INPUT; Transmitter rated at 5 watts input, (maximum for Class "D" service) AM modulated.

**OPERATING POWER:** Two models available, 12 volts DC only and 115 AC only. Power supplies are built in. COMPACT: 6¾ inch wide; 5¼ inch high; 6¾ inch deep. Price for both models complete with press-to-talk microphone and crystal for one channel **$124.50**

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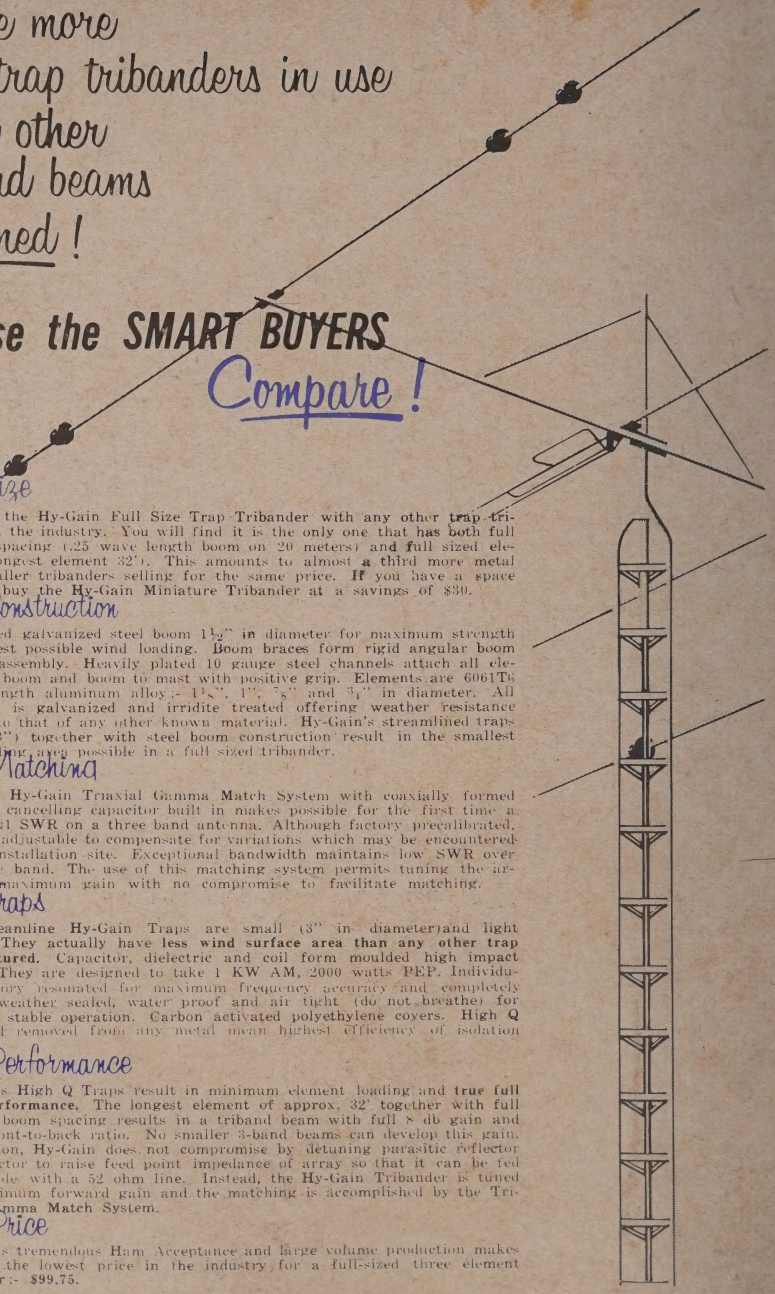

## because the SMART BUYERS Compare!

### Compare Size

Compare the Hy-Gain Full Size Trap Tribander with any other trap tribander in the industry. You will find it is the only one that has both full element spacing (.25 wave length boom on 20 meters) and full sized elements (longest element 32'). This amounts to almost a third more metal than smaller tribanders selling for the same price. If you have a space problem buy the Hy-Gain Miniature Tribander at a savings of $30.

### Compare Construction

Hot dipped galvanized steel boom 1½" in diameter for maximum strength with lowest possible wind loading. Boom braces form rigid angular boom to mast assembly. Heavily plated 10 gauge steel channels attach all elements to boom and boom to mast with positive grip. Elements are 6061T6 high strength aluminum alloy :- 1¼", 1", ⅞" and ¾" in diameter. All hardware is galvanized and irridite treated offering weather resistance superior to that of any other known material. Hy-Gain's streamlined traps (only 2x3") together with steel boom construction result in the smallest wind loading ever possible in a full sized tribander.

### Compare Matching

Exclusive Hy-Gain Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built in makes possible for the first time a perfect 1:1 SWR on a three band antenna. Although factory precalibrated, it is also adjustable to compensate for variations which may be encountered at each installation site. Exceptional bandwidth maintains low SWR over the entire band. The use of this matching system permits tuning the array for maximum gain with no compromise to facilitate matching.

### Compare Traps

The Streamline Hy-Gain Traps are small (3" in diameter) and light weight. **They actually have less wind surface area than any other trap manufactured.** Capacitor, dielectric and coil form moulded high impact styron. They are designed to take 1 KW AM, 2000 watts PEP. Individually factory resonated for maximum frequency accuracy and completely factory weather sealed, water proof and air tight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. High Q coils well removed from any metal mean highest efficiency of isolation action.

### Compare Performance

Hy-Gain's High Q Traps result in minimum element loading and **true full sized performance.** The longest element of approx. 32' together with full size 18' boom spacing results in a triband beam with full 8 db gain and 25 db front-to-back ratio. No smaller 3-band beams can develop this gain. In addition, Hy-Gain does not compromise by detuning parasitic reflector and director to raise feed point impedance of array so that it can be fed split dipole with a 52 ohm line. Instead, the Hy-Gain Tribander is tuned for maximum forward gain and the matching is accomplished by the Triaxial Gamma Match System.

### Compare Price

Hy-Gain's tremendous Ham Acceptance and large volume production makes possible the lowest price in the industry for a full-sized three element tribander :- $99.75.

**See the Complete Line of Hy-Gain Antenna Products at These West Coast Distributors**

Radio Parts of Arizona
Phoenix, Arizona

Southwest Wholesale Radio, Inc.
Phoenix, Arizona

Elliot Electronics
Tucson, Arizona

Ford-Electronics
Buena Park, California

Valley Electronic Supply Co.
Burbank, California

[illegible] W. Wright Co.
[illegible] Mesa, California

[illegible] [illegible]mpson Radio Supply
Culver[illegible] California

Downey [illegible]ics
Downey

Kimbal
El Mi[illegible]

[illegible]
Fresno, California

Gil Severns Distributors
Hemet, California

Universal Radio Supply
Inglewood, California

Larry Lynde Electronics
Long Beach, California

Scott Radio Supply, Inc.
Long Beach, California

Federated Purchasers
W. Los Angeles, California

Henry Radio Co.
Los Angeles, California

Radio Products Sales, Inc.
Los Angeles, California

Universal Distributors, Inc.
Los Angeles, California

Telcoa Equipment Co.
Malibu, California

Wholesale Electronics
Monterey, California

Elmar Electronics
Oakland, California

Dow Radio, Inc.
Pasadena, California

Kitron Radio Co.
Pomona, California

Market Radio
Sacramento, California

Sampson Electronic Services, Inc.
San Bernardino, California

Radio Parts Co.
San Diego, California

Western Radio & TV
San Diego, California

Sacramento Amateur Radio & TV Supplies
Sacramento, California

San Francisco Radio
San Francisco, California

Macs Radio Supply
South Gate, California

Valley Electronic Supply Co.
Van Nuys, California

Basham-Christensen Co.
Santa Rosa, California

Frank Quement
San Jose, California

Thrifty TV Supply Co.
Van Nuys, California

United Electronics Wholesale
Twin Falls, Idaho

Portland Radio Supply Co.
Portland, Oregon

United Radio Supply, Inc.
Portland, Oregon

Carter Supply Co.
Ogden, Utah

Tri-State Electronic Supply
Ogden, Utah

Manwill Supply Co.
Provo, Utah

Standard Supply Co.
Salt Lake City, Utah

C & G Radio Supply Co.
Aberdeen, Washington

C & G Radio Supply Co.
Bremerton, Washington

C & G Radio Supply Co.
Centralia, Washington

C & G Radio Supply Co.
Olympia, Washington

Amateur Radio Supply
Seattle, Washington

Seattle Radio Supply
Seattle, Washington

Pacific Electronic Sales
Seattle, Washington

Northwest Electronics, Inc.
Spokane, Washington

C & G Radio Supply Co.
Tacoma, Washington